YAMAHA

1999 - 2002

MOTORCYCLE

SERVICE MANUAL

Model : CW50L, CW50M, CW50N, CW50P

4RW281972K00

NOTICE

This manual was written by the MBK INDUSTRIE primarily for use by YAMAHA dealers and their qualified mechanics. It is not possible to put an entire mechanic's education into one manual, so it is assumed that persons using this book to perform maintenance and repairs on YAMAHA scooters have a basic understanding of the mechanical concepts and procedures inherent in scooter repair technology. Without such knowledge, attempted repairs or service to this model may render it unfit to use and/or unsafe.

MBK INDUSTRIE is continually striving to improve all models manufactured. Modifications and significant changes in specifications or procedures will be forwarded to all Authorized YAMAHA dealers and will, where applicable, appear in future editions of this manual.

DOCUMENTATION TECHNIQUE
MBK INDUSTRIE

PARTICULARLY IMPORTANT INFORMATION
This material is distinguished by the following notation:

⚠ — The safety Alert Symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

⚠ WARNING — Failure to follow WARNING instructions could result in severe injury or death to the scooter operator, a bystander, or a person inspecting or repairing the scooter.

CAUTION: — A CAUTION indicates special precautions that must be taken to avoid damage to the scooter.

NOTE: — A NOTE provides key information to make procedures easier or clearer.

CW50
SERVICE MANUAL
© 1997 by MBK INDUSTRIE
3st Edition, April 1997
All rights reserved. Any reprinting or unauthorized use without the written permission of MBK INDUSTRIE is expressly prohibited.

HOW TO USE THIS MANUAL

CONSTRUCTION OF THIS MANUAL

This manual consists of chapters for the main categories of subjects. (See «illustrated symbols).

1st title ① This is a chapter with its symbol on the upper right of each page.

2nd title ② This title appears on the upper of each page on the left of the chapter symbol. (For the chapter «Periodic inspection and adjustment» the 3rd title appears.)

3rd title ③ This is a final title.

MANUAL FORMAT

All of the procedures in this manual are organized in a sequential, step-by-step format. The information has been compiled to provide the mechanic with an easy to read, handy reference that contains comprehensive explanations of all disassembly, repair, assembly, and inspections.

A set of particularly important procedure ④ is placed between a line of asterisks " * " with each step preceded by " • ".

IMPORTANT FEATURES

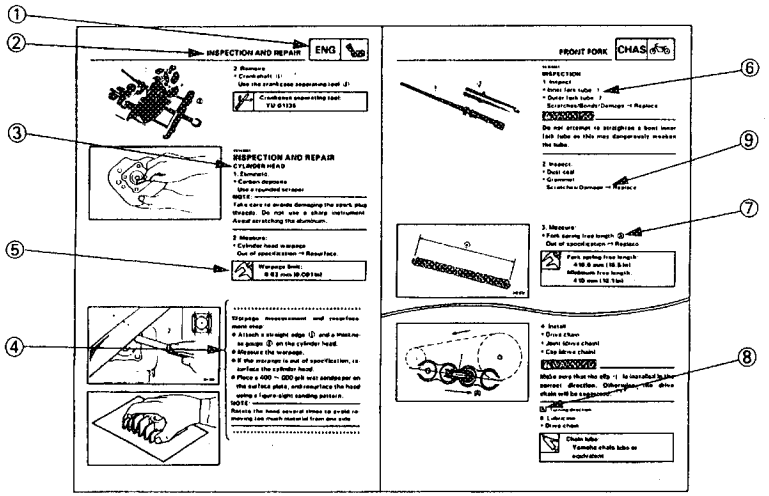
• Data and a special tools are framed in a box preceded by a relevant symbol ⑤.

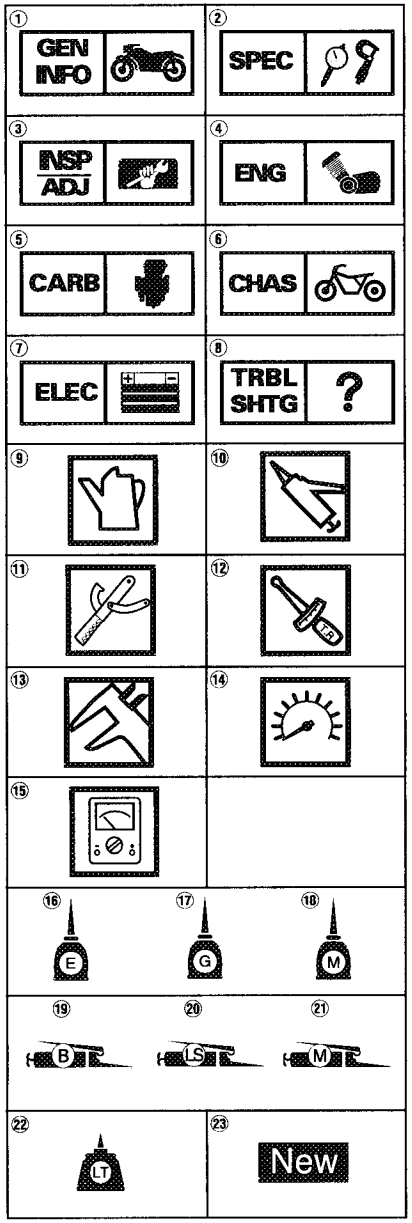
• An encircled numeral ⑥ indicates a part name, and an encircled alphabetical letter data for an alignments mark ⑦, the others being indicated by an alphabetical letter in a box ⑧.

• A condition of a faulty component will precede an arrow symbol and the course of action required the symbol ⑨.

EXPLODED DIAGRAM

Each chapter provides exploded diagrams are before each disassembly section for ease in identifying correct disassembly and assembly procedures.





ILLUSTRATED SYMBOLS

(REFER TO THE ILLUSTRATION)

Illustrated symbols ① to ② are designed as thumb tabs to indicate the chapter's number and content.

① General information
② Specifications
③ Periodic inspection and adjustment
④ Engine
⑤ Carburetion
⑥ Chassis
⑦ Electrical
⑧ Troubleshooting

Illustrated symbols ⑨ to ⑮ are used to identify the specifications appearing in the text.

⑨ Filling fluid
⑩ Lubricant
⑪ Special tool
⑫ Tightening
⑬ Wear limit, clearance
⑭ Engine speed
⑮ Ω, V, A

Illustrated symbols ⑯ to ㉓ in the exploded diagram indicate grade of lubricant and location of lubrication point.

⑯ Apply engine oil
⑰ Apply gear oil
⑱ Apply molybdenum disulfide oil
⑲ Apply wheel bearing grease
⑳ Apply lightweight lithium-soap base grease
㉑ Apply molybdenum disulfide grease
㉒ Apply locking agent (THREADLOCK®)
㉓ Use new one

INDEX

GENERAL INFORMATION — GEN INFO 1

SPECIFICATIONS — SPEC 2

PERIODIC INSPECTION AND ADJUSTMENT — INSP ADJ 3

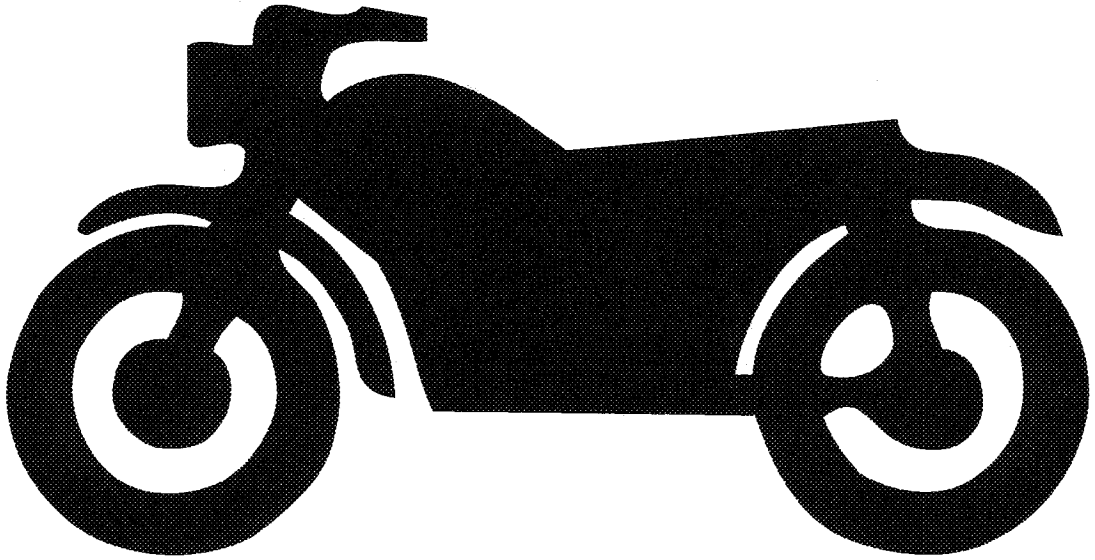
ENGINE OVERHAUL — ENG 4

CARBURETION — CARB 5

CHASSIS — CHAS 6

ELECTRICAL — ELEC 7

TROUBLESHOOTING — TRBL SHTG 8



GEN INFO

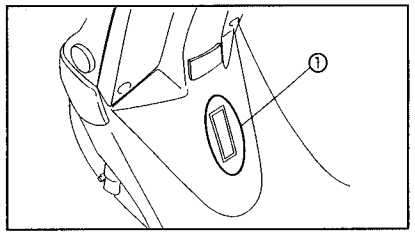
1

CHAPTER 1.
GENERAL INFORMATION

SCOOTER IDENTIFICATION A-8
VEHICLE IDENTIFICATION NUMBER A-8
ENGINE SERIAL NUMBER A-8

IMPORTANT INFORMATION A-8
ALL REPLACEMENT PARTS A-8
GASKETS, OIL SEALS, AND O-RINGS A-8
LOCK WASHERS/PLATES AND COTTER PINS A-8
BEARINGS AND OIL SEALS A-8
CIRCLIPS A-9

SPECIAL TOOLS A-9
FOR TUNE UP A-9
FOR ENGINE SERVICE A-9
FOR CHASSIS SERVICE A-10
FOR ELECTRICAL COMPONENTS A-10



GENERAL INFORMATION

SCOOTER IDENTIFICATION

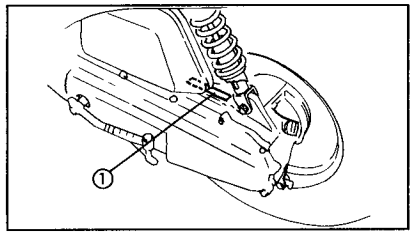
VEHICLE IDENTIFICATION NUMBER

The vehicle identification number ① is stamped into the frame.

NOTE:

The vehicle identification number is used to identify your scooter and may be used to register your scooter with the licensing authority in your state.

Initial serial number:
VG54RWN0*WA101301



ENGINE SERIAL NUMBER

The engine serial number ① is stamped into the crankcase.

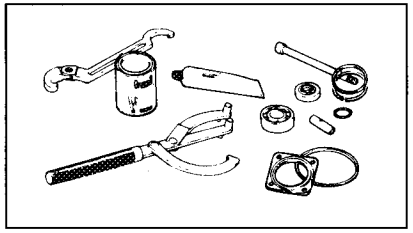
NOTE:

The first three digits of these numbers are for model identifications; the remaining digits are the unit production number.

Initial serial number:
4UY-200101

NOTE:

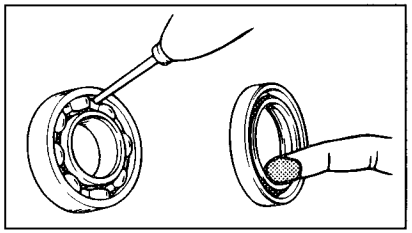
Designs and specifications are subject to change without notice.



IMPORTANT INFORMATION

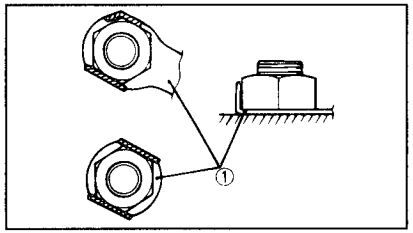
ALL REPLACEMENT PARTS

1. Use only genuine parts for all replacements. Use oil and/or grease recommended by MBK/ YAMAHA for assembly and adjustment. Other brands may be similar in function and appearance, but inferior in quality.



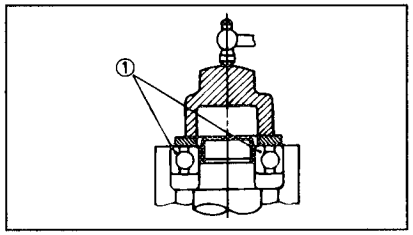
GASKETS, OIL SEALS, AND O-RINGS

1. All gaskets, seals and O-rings should be replaced when an engine is overhauled. All gaskets surfaces, oil seal lips and O-rings must be cleaned.
2. Properly oil all mating parts and bearing during reassembly. Apply grease to the oil seal lips.



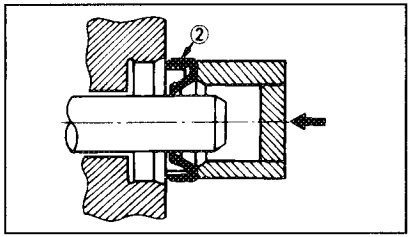
LOCK WASHERS/PLATES AND COTTER PINS

1. All lock washers/plates ① and cotter pins must be replaced when they are removed. Lock tab(s) should be bent along the bolt or nut flat(s) after the bolt or nut has been properly tightened.



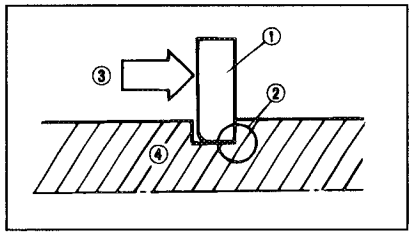
BEARINGS AND OIL SEALS

1. Install the bearing(s) ① and oil seal(s) ② with their manufacturer's marks or numbers facing outward. (In other words, the stamped letters must be on the side exposed to view.) When installing oil seal(s), apply a light coating of lightweight lithium base grease to the seal lip(s). Oil the bearings liberally when installing.



CAUTION:

Do not use compressed air to spin the bearings dry. This causes damage to the bearing surfaces.



CIRCLIPS

1. All circlips should be inspected carefully before reassembly. Always replace piston pin clips once they have been removed. Replace bent circlips. When installing a circlip ① make sure that the sharp edge ② is positioned opposite to the thrust ③ it receives. See the sectional view.

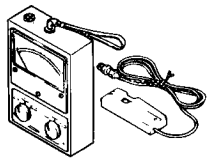
④ Shaft

SPECIAL TOOLS

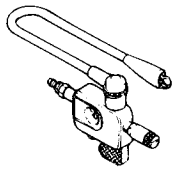
The proper special tools are necessary for complete and accurate tune-up and assembly. Using the correct special tool will help prevent damage caused by the use of improper tools or improvised techniques.

FOR TUNE UP

Inductive tachometer
90890-03113

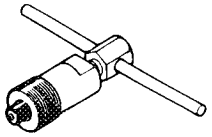


Ignition checker
90890-06754

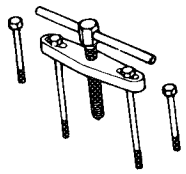


FOR ENGINE SERVICE

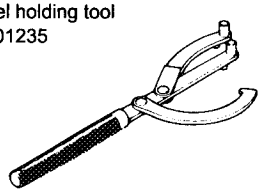
Flywheel magneto puller
90890-01189



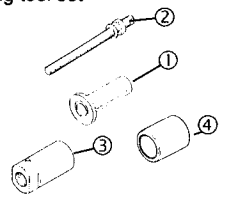
Crankcase separating tool
90890-01135



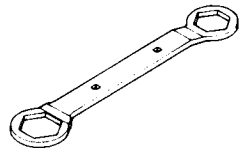
Flywheel holding tool
90890-01235



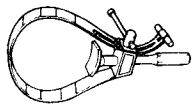
Crankshaft installing tool set
90890-01274 ①
90890-01275 ②
90890-01277 ③
90890-01411 ④



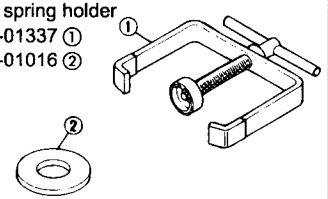
Clutch serving nut wrench
90890-01348



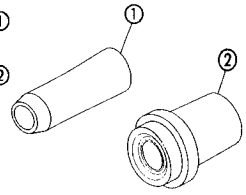
Sheave holder
90890-01701



Clutch spring holder
90890-01337 ①
90890-01016 ②

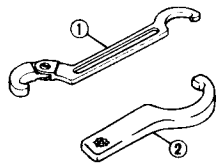


Oil Seal Guide
90890-01409 ①
Oil Seal Driver
90890-01410 ②

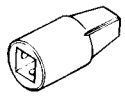


FOR CHASSIS SERVICE

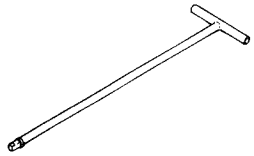
Ring nut wrench
90890-01268 ①
90890-01403 ②



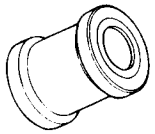
Damper rod holder
90890-01294



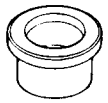
T-Handle
90890-01326



Oil seal guide
90890-01184

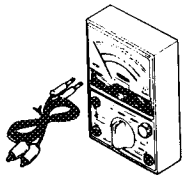


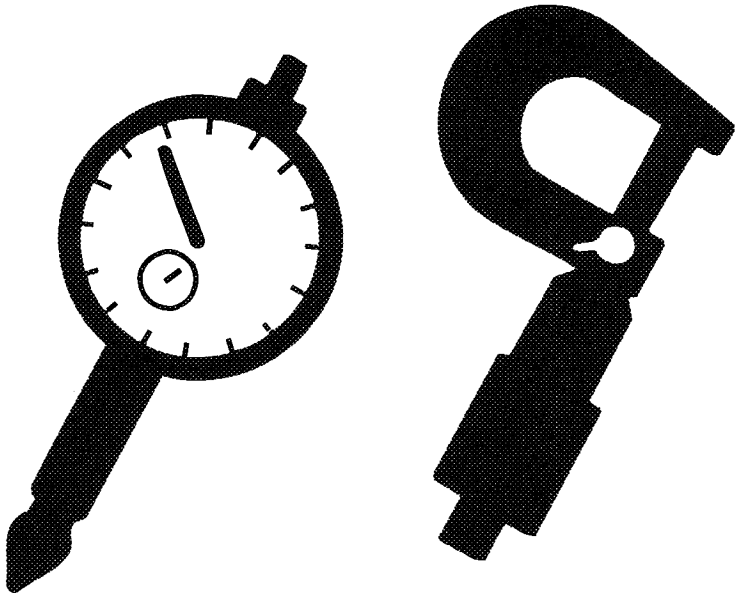
Oil seal guide adapter
90890-01186



FOR ELECTRICAL COMPONENT

Pocket Tester
90890-03112





SPEC 2

SPEC 99

CHAPTER 2.
SPECIFICATIONS

GENERAL SPECIFICATIONS A-14

MAINTENANCE SPECIFICATIONS A-15
ENGINE A-15
CHASSIS A-16
ELECTRICAL B-1

CABLE ROUTING B-2

SPECIFICATIONS

GENERAL SPECIFICATIONS

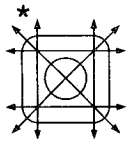
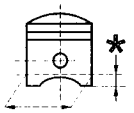
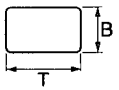
Model	CW50
Dimensions:	
Overall length	1,740 mm (68.5 in)
Overall width	665 mm (26.2 in)
Overall height	1,050 mm (41.3 in)
Seat height	745 mm (29.3 in)
Wheelbase	1,170 mm (46.0 in)
Minimum ground clearance	125 mm (4.9 in)
Basic weight:	
With oil and full fuel tank	78 kg (172 lb)
Minimum turning radius:	1,800 mm (70.9 in)
Engine:	
Type	Air-cooled 2-stroke, gasoline torque induction.
Cylinder arrangement	Single cylinder, Vertical
Displacement	49 cm^3
Bore x stroke	40 x 39.2 mm (1.57 x 1.54 in)
Compression ratio	7.01 : 1
Starting system	Electric and kick starter
Lubrication system:	Separate lubrication (Yamaha Autolube)
Oil type or grade:	
Engine oil	Semi-synthetic oil in accordance to the API TC TS C3 standard.
Transmission oil	SAE 10W30 type SE motor oil
Oil capacity:	
Engine oil:	
Total amount	1.3 L (1.14 Imp qt, 1.37 US qt)
Transmission oil:	
Periodic oil change	0.11 L (0.10 Impqt, 0.12 US qt)
Total amount	0.13 L (0.11 Impqt, 0.13 US qt)
Air filter:	Wet type element
Fuel:	
Type	Regular unleaded gazoline (RON 91 mini)
Tank capacity	4.6 L (1.01 Imp gal, 1.21 US gal)
Carburetor:	
Type	PHBN 12HS
Manufacturer	DELL'ORTO
Spark plug:	
Type/Manufacturer	BR8HS/NGK
Gap	0.5 ~ 0.7 mm (0.020 ~ 0.028 in)

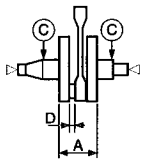
Model		CW50
Clutch type:		Dry, centrifugal automatic
Transmission:		
Primary reduction system		Helical gear
Primary reduction ratio		52/13 (4.000)
Secondary reduction system		Spur gear
Secondary reduction ratio		43/13 (3.3077)
Transmission		V-belt
Operation		Automatic
Chassis:		
Frame type		Steel tube underbone
Caster angle		27°
Trail		90 mm (3.54 in)
Tire:		
Type		Tubeless
Size	front	120/90 - 10
	rear	130/90 -10
Manufacturer	front	DUNLOP (TRAIL MAX)
		MICHELIN (REGGAE TL)
	rear	DUNLOP (TRAIL MAX)
		MICHELIN (REGGAE TL)
Tire pressure (cold tire):		
Maximum load-except scooter		152 kg (335 lbs)
Up to 90 kg (198 lbs) load		
	Front	100 kPa (1.00 kgf/cm^2, 15 psi)
	Rear	125 kPa (1.25 kgf/cm^2, 18 psi)
90 kg (198 lbs) ~ maximum load		
	Front	100 kPa (1.00 kgf/cm^2, 15 psi)
	Rear	150 kPa (1.50 kgf/cm^2, 21 psi)
Brake:		
Front brake type		Disc brake
Operation		Right hand operation
Rear brake type		Drum brake
Operation		Left hand operation
Suspension:		
Front		Telescopic fork
Rear		Unit swing
Shock absorber:		
Front		Coil spring/Oil damper
Rear		Coil spring/Oil damper
Wheel travel:		
Front wheel travel		62 mm (2.44 in)
Rear wheel travel		60 mm (2.36 in)

Model		CW50
Electrical:		
Ignition system		CDI
Charging system		Flywheel magneto
Battery type/model		GM4-3B/YB4L-B/FB4L-B
Battery capacity		12V 4AH
Headlight type:		Bulb
Bulb wattage / quantity:		
Headlight		12V 25W/25 W x 2
Taillight/brake light		12V 5W/21 W x 1
Flasher light	Front	12V 10W x 2
	Rear	12V 10W x 2
Meter light		12V 3W x 1
Warning lights wattage / quantity:		
"OIL"		12V 3W x 1
"TURN"		12V 3W x 1
"HIGH BEAM"		12V 3W x 1

MAINTENANCE SPECIFICATIONS

ENGINE

Model	CW50
Cylinder head:	
Warp limit 	0.03 mm (0.0012 in) * Lines indicate straight edge measurements.
Cylinder:	
Bore size	39.993 ~ 40.012 mm (1.574 ~ 1.575 in)
<Limit>	<40.1 mm (1.579 in)>
Taper limit	0.006 mm (0.0002 in)
Piston:	
Piston size	39.952 ~ 39.972 mm (1.573 ~ 1.574 in)
Measuring point * 	5.0 mm (0.2 in)
Piston clearance	0.034 ~ 0.047 mm (0.0013 ~ 0.0018 in)
<Limit>	<0.1 mm (0.004 in)>
Piston pin bore size	10.004 ~ 10.015 mm (0.3938 ~ 0.3943 in)
Piston pin:	
Outside diameter	9.996 ~ 10.000 mm (0.3935 ~ 0.3937 in)
Piston ring:	
Sectional sketch (B x T)/Type: 	
Top ring	1.2 ~ 1.8 mm (0.047 ~ 0.070 in)
2nd ring	1.2 ~ 1.8 mm (0.047 ~ 0.070 in)
End gap (installed):	
Top ring	0.15 ~ 0.30 mm (0.006 ~ 0.012 in)
2nd ring	0.15 ~ 0.30 mm (0.006 ~ 0.012 in)
Side clearance (installed):	
Top ring	0.03 ~ 0.05 mm (0.0012 ~ 0.0020 in)
2nd ring	0.03 ~ 0.05 mm (0.0012 ~ 0.0020 in)

Model	CW50
Crankshaft:	
	
Crank width "A"	37.90 ~ 37.95 mm (1.492 ~ 1.494 in)
Runout limit "C"	0.03 mm (0.0012 in)
Connecting rod big end side clearance "D"	0.2 ~ 0.5 mm (0.008 ~ 0.020 in)
Automatic centrifugal clutch:	
Shoe thickness	4.0 mm (0.16 in)
<Wear limit>	<2.5 mm (0.10 in)>
Clutch shoe spring free length	26.2 mm (1.03 in)
Clutch-in revolution	3.200 ~ 3.600 r.p.m.
Clutch-stall revolution	6.300 ~ 6.900 r.p.m.
V-belt:	
Width	15 mm (0.59 in)
<Wear limit>	<13.5 mm (0.53 in)>
Transmission:	
Main axle runout limit	0.08 mm (0.003 in)
Drive axle runout limit	0.08 mm (0.003 in)
Kick starter:	
Type	Ratchet type
Kick clip tension	150 ~ 250 g (5.3 ~ 8.8 oz)
Carburetor:	
I.D. mark	PHBN12HS
Main jet (M.J.)	# 93
Main air jet (M.A.J.)	2.0
Jet needle (J.N.)	A21-3/5
Needle jet (N.J.)	2.110
Cutaway (C.A.)	4.0
Pilot jet (P.J.)	# 36
Bypass (B.P.1)	0.8
Pilot air screw (A.S.)	1-5/8 ± 1/4 out
Valve seat size (V.S.)	1.2
Starter jet (G.S.1)	# 40
Float height (F.H.)	15 ~ 17 mm (0.59 ~ 0.67 in)
Fuel height (F.L.)	20.5 ~ 22.5 mm (0.80 ~ 0.88 in)
(Center of float chamber / Fuel height)	
Engine idle speed	1800 ± 200 rpm
Reed valve:	
Valve stopper height	4.0 ~ 4.4 mm (0.157 ~ 0.173 in)
Reed valve clearance	0.2 mm (0.008 in)
Lubrication system:	Autolube pump
Stroke	2.62 mm (0.10 in)
Bore	0.5 mm (0.02 in)

CHASSIS

Model	CW50
Steering system:	
Steering bearing type	Ball bearing
No/Size of steel balls:	
Upper	22 pcs (3/16 in)
Lower	22 pcs (3/16 in)
Front suspension:	
Front fork travel	70 mm (2.75 in)
Spring Rate (K1)	10.8 N/mm (1.08 kg/mm, 60.46 lb/in)
Stroke (K1)	0 ~ 40 mm (0 ~ 1.57 in)
Spring Rate (K2)	14.4 N/mm (1.44 kg/mm, 80.61 lb/mm)
Stroke (K2)	40 ~ 77 mm (1.57 in ~ 3.03 in)
Optional spring	No
Rear suspension:	
Shock absorber travel	60 mm (2.36 in)
Spring free length	202 mm (7.95 in)
Spring fitting length	187.5 mm (7.38 in)
Spring Rate	32.5 N/mm (3.25 kg/mm, 181.93 lb/mm)
Stroke	0 ~ 44 mm (0 ~ 1.73 in)
Optional spring	No
Wheels:	
Front wheel type	Cast wheel
Rear wheel type	Cast wheel
Front wheel size	MT 3.50 x10
Material	Aluminium
Front wheel size	MT 3.50 x10
Material	Aluminium
Rim runout limit:	
Front	2.0 mm (0.08 in)
Rear	2.0 mm (0.08 in)
Front disk brake:	
Type	Single disk
Diameter & thickness	155 x 3.5 mm (6.102 x 0.137 in)
Pad thickness	3.25 mm (0.127 in)
<Wear limit>	<0.8 mm (0.03 in)>
Master cylinder inside diameter	11 mm (0.43 in)
Caliper cylinder inside diameter	30 mm (1.18 in)
Brake fluid type	DOT #3 or DOT #4
Rear drum brake:	
Type	Leading, trailing
Drum inside diameter	110 mm (4.33 in)
<Wear limit>	<110.5 mm (4.35 in)>
Lining thickness	4.0 mm (0.16 in)
<Wear limit>	<2.0 mm (0.08 in)>
Spring free length	54 mm (2.125 in)
Front brake lever freeplay:	10 ~ 20 mm (0.4 ~ 0.8 in)
Rear brake lever freeplay:	10 ~ 20 mm (0.4 ~ 0.8 in)

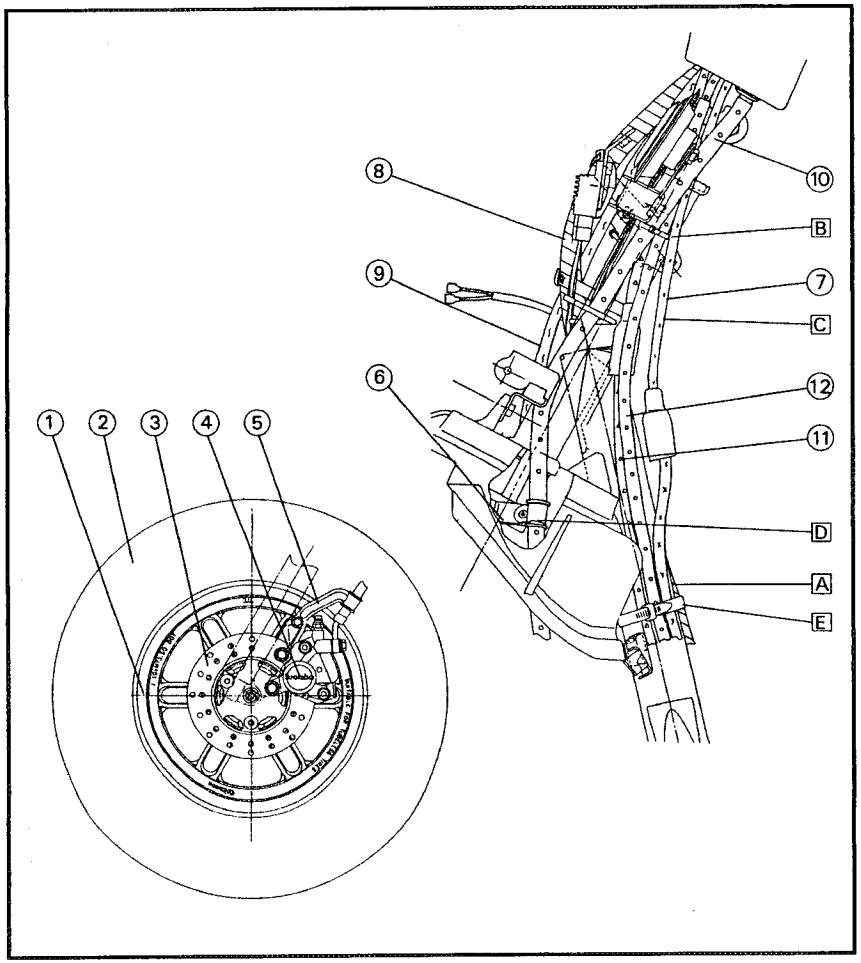
ELECTRICAL

Model	CW50
Voltage:	12 V
Ignition system:	
Ignition timing (B.T.D.C.)	14° at 5.000 r/min
CDI:	
Pickup coil resistance (color)	400 ~ 600 Ω at 20°C (68°F) (White/Red-Black)
Source coil resistance (color)	640 ~ 960 Ω at 20°C (68°F) (Black/Red-Black)
Ignition coil:	
Minimum spark length	6 mm (0.23 in)
Primary coil resistance	0.56 ~ 0.84 Ω at 20°C (68°F)
Secondary coil resistance	5.68 ~ 8.52 Ωk at 20°C (68°F)
Spark plug cap:	
Resistance	5 kΩ at 20°C (68°F)
CDI Magneto:	
Lighting coil resistance	0.32 ~ 0.48 Ω at 20°C (68°F)(Yellow/Red-Black)
Lighting coil resistance	0.48 ~ 0.72 Ω at 20°C (68°F)(White-Black)
Voltage regulator/Rectifier:	
Type	Semi-conductor, short-circuit type
No load regulated voltage	13 ~ 14 V
Capacity	8 A
Withstand voltage	600 V

Model	CW50
Battery:	
Capacity	12V, 4 Ah
Specific gravity	1.280
Starter motor:	
Output	0.14 kW
Armature coil resistance	0.072 Ω a 20°C (68°F)
Brush length	6.8 mm (0.27 in)
<Wear limit>	<5.3 mm (0.21 in)>
Brush spring pressure	150 ~ 650 gr (5.29 ~ 22.92 oz)
Commutator diameter	15.8 mm (0.62 in)
<Wear limit>	<15.0 mm (0.60 in)>
Mica undercut	1.15 mm (0.045 in)
Starter relay:	
Amperage rating	20 A
Coil resistance	54 ~ 66 Ω at 20°C (68°F)
Horn:	
Type/Quantity	Plain type/1 pc.
Model/Manufacturer	TR9/TRANSVAL
Maximum amperage	2.5 A
Flasher relay:	
Type	Condenser type
Self cancelling device	No
Flasher frequency	70 ~ 90 cycle/min
Wattage	2 x 10W + 4 W
Circuit breaker:	
Type	Fuse
Amperage for individual circuit x Quantity:	
Main	7 A x 1
Fuel sender unit:	
Resistance (full)	4 ~ 10 Ω at 20°C (68°F)
(empty)	90 ~ 100 Ω at 20°C (68°F)

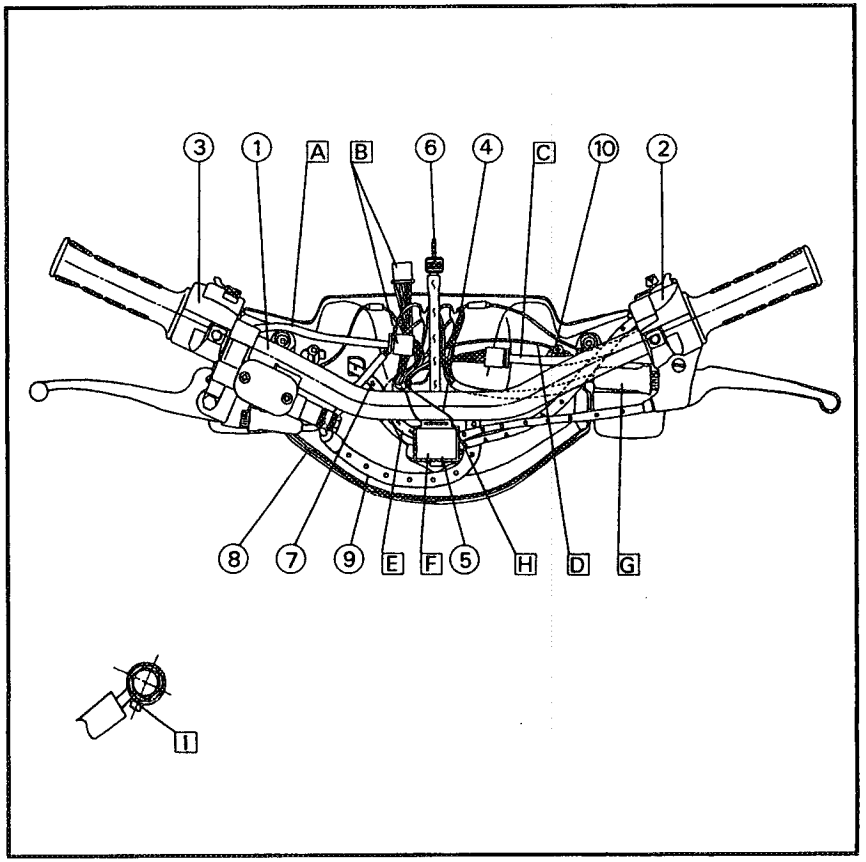
① Rim
② Tire
③ Brake disc
④ Brake caliper
⑤ Brake hose guide (Lower)
⑥ Brake hose guide (Upper)
⑦ Throttle cable
⑧ Wire harness
⑨ Speedometer cable
⑩ Brake hose
⑪ Choke cable
⑫ Rear brake cable

[A] Do not cover the frame number.
[B] Attach the brake hose, starter switch cable and the brake cable together behind the horn bracket.
[C] The throttle cable must have sufficient free play.
[D] Clamp the brake hose into the upper holder.
[E] With a band tie the choke cable, the throotle cable and the rear brake cable to the left side, the wire harness to the right side of the frame.



① Handlebar
② Left handle bar switch
③ Right handlebar switch
④ Handlebar wire harness holder
⑤ Flasher relay
⑥ Speedometer cable
⑦ Throttle cable
⑧ Lower handlebar cover
⑨ Front brake hose
⑩ Flasher ground

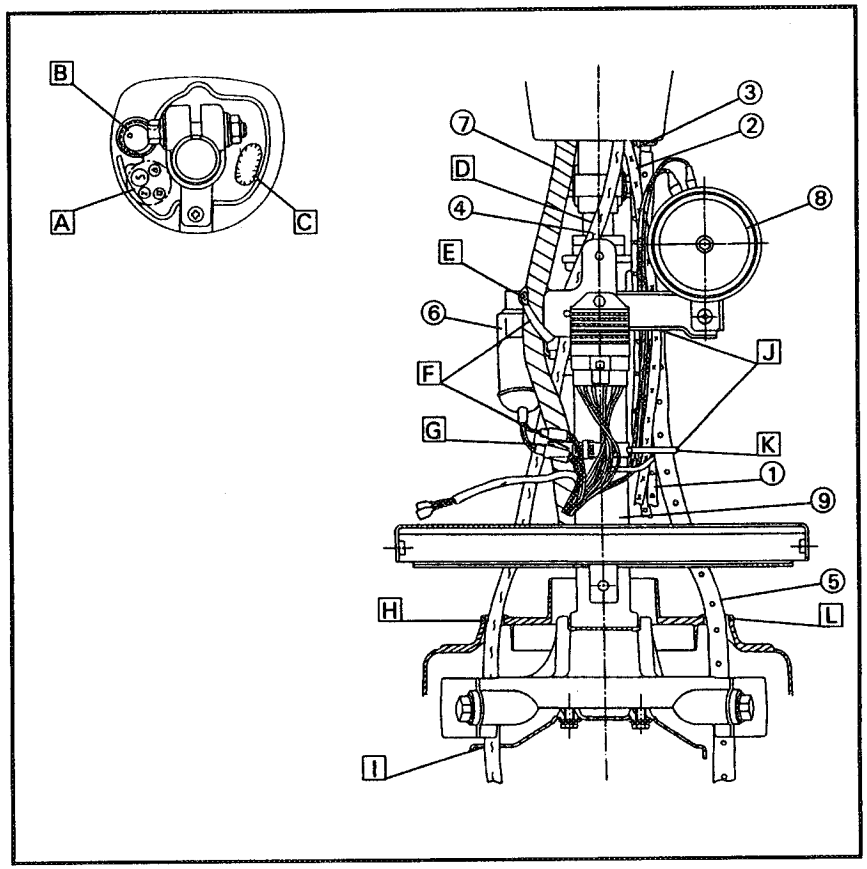
[A] The right handlebar switch leads must pass along the underside of the handlebar, then behind the boss on the lower handlebar cover.
[B] Pass the couplers behind the speedometer cable, and after connecting them, fit them under the right side of the speedometer.
[C] The left handlebar switch leads must pass along the underside of the handlebar, then in front of the boss on the lower handlebar cover.
[D] Attach the front flasher ground to the handlebar.
[E] The throttle cable must pass in front of the handlebar.
[F] Pass the flasher relay leads under the handlebar.
[G] The brake light leads must pass along the underside of the handlebar (left and right).
[H] The wire harness holder must pass over the handlebar.
[I] The brake hose union bolt must touch the right side of the boss.

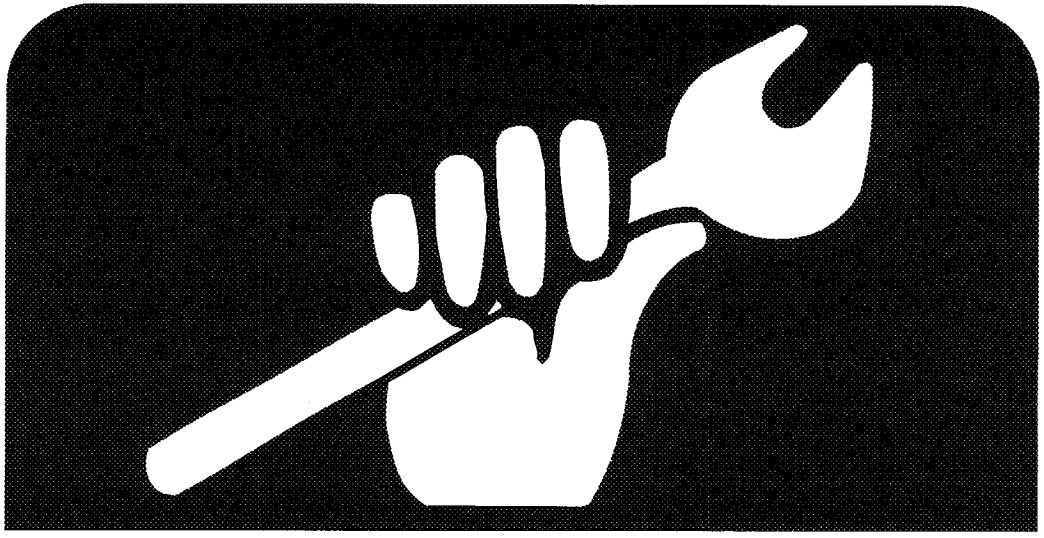


CABLE ROUTING

① Choke cable
② Throttle cable
③ Rear brake cable
④ Speedometer cable
⑤ Front brake hose
⑥ Main switch
⑦ Wire harness
⑧ Horn
⑨ Steering tube
⑩ Lower cover

[A] Tie the choke cable,throttle cable, rear brake cable, and speedometer cable to the left side of the handlebar.
[B] Pass the wire harness along the right side of the handlebar.
[C] Clamp the front brake hose to the lower cover.
[D] The speedometer cable must pass between the steering tube and the main switch bracket.
[E] Attach the wire harness to the side of the main switch bracket with a band.
[F] The wire harness must run straight (no loops)between the two bands.
[G] Attach the wire harness with a band to the steering tube just above the wire bracket.
[H] The speedometer cable must pass through the hole in the front fender.
[I] The speedometer cable must pass through the hole in the lower fender.
[J] The horn leads must pass behind the horn bracket and behind the wire bracket.
[K] The front brake hose must pass through the wire bracket.
[L] The front brake hosde must pass through the hole in the fender.





INSP / ADJ

3

INSP ADJ

CHAPTER 3.
PERIODIC INSPECTION AND ADJUSTMENT

INTRODUCTION B-7

PERIODIC MAINTENANCE/LUBRICATION INTERVALS B-7

COVERS B-7
- REMOVAL B-7
- INSTALLATION B-8

ENGINE B-9
- ENGINE IDLE SPEED ADJUSTMENT B-9
- THROTTLE CABLE FREE PLAY ADJUSTMENT B-9
- SPARK PLUG INSPECTION B-10
- AUTOLUBE PUMP AIR BLEEDING B-10
- ENGINE OIL LEVEL INSPECTION B-11
- TRANSMISSION OIL REPLACEMENT B-11
- AIR CLEANER ELEMENT CLEANING B-12

CHASSIS B-12
- FRONT BRAKE LEVER FREE PLAY ADJUSTMENT B-12
- REAR BRAKE LEVER FREE PLAY ADJUSTMENT B-12
- BRAKE PADS INSPECTION B-12
- BRAKE SHOES INSPECTION B-13
- AIR BLEEDING (HYDRAULIC BRAKE SYSTEM) B-13
- STEERING HEAD ADJUSTMENT B-14
- TIRE INSPECTION B-14
- WHEEL INSPECTION B-15
- CABLE INSPECTION AND LUBRICATION B-15
- LEVER LUBRICATION B-15
- CENTERSTAND LUBRICATION B-15
- REAR SHOCK ABSORBER B-15

ELECTRICAL B-16
- BATTERY INSPECTION B-16
- FUSE INSPECTION B-16
- HEADLIGHT BEAM ADJUSTMENT C-1

PERIODIC INSPECTION AND ADJUSTMENT

INTRODUCTION

This chapter includes all information necessary to perform recommended inspections and adjustments. These preventive maintenance procedures, if followed, will ensure more reliable vehicle operation and a longer service life. The need for costly overhaul work will be greatly reduced. This information applies to vehicles already in service as well as new vehicles that are being prepared for sale. All service technicians should be familiar with this entire chapter.

PERIODIC MAINTENANCE/LUBRICATION

Unit : Km(miles)

		ITEM	ROUTINE	BREAK-IN 1,000(600)	EVERY 3,000 (2,000)or 6 months	EVERY 6,000 (4,000)or 12 months
1		Spark plug	• Check condition. • Clean or replace if necessary.	○	○	○
2		Air filter	• Clean. • Replace if necessary.		○	○
3	*	Carburetor	• Check idle speed/choke operation. • Adjust if necessary.	○		○
4	*	Fuel line	• Check fuel hose and vacuum pipe for cracks or damage. • Replace if necessary.		○	○
5	*	Transmission oil	• Check for oil leakage. • Correct if necessary. • Replace every 12,000 (8,000) or 24 months. (Warm engine before draining.)	REPLACE	○	○
6	*	Autolube pump	• Check operation. • Correct if necessary. • Bleed the air.	○		○
7	*	Front brake system	• Check operation/fluid leakage/See NOTE. (Page 9-3). • Correct if necessary.	○	○	○
8	*	Rear brake system	• Check operation. • Adjust if necessary.		○	○
9	*	Wheels	• Check damage/runout/tightening torque. • Replace/tighten if necessary.		○	○
10	*	Wheel bearings	• Check bearing assembly for looseness/damage. • Replace if damaged.		○	○
11	*	Steering bearing	• Check bearing assembly for looseness. • Correct if necessary. • Moderately repack every 12,000 (8,000) or 24 months.**	○	○	○
12	*	Rear shock absorber	• Check operation/oil leakage. • Replace if necessary.		○	○
13	*	V-belt	• Check damage and wear. • Replace if necessary.			○
14	*	Fitting/Fasteners	• Check all chassis fittings and fasteners. • Tighten if necessary.	○	○	○
15	*	Centerstand	• Check operation. • Repair if necessary.	○	○	○
16	*	Battery	• Check specific gravity. • Check breather pipe for proper operation. • Correct if necessary.		○	○

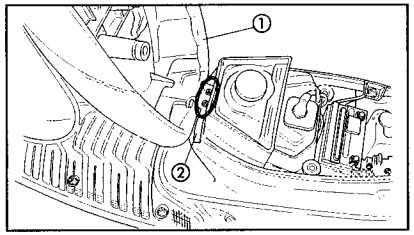
Items marked with an asterisk (*) require special tools, data and technical skills for servicing.
Take the scooter to a Yamaha Dealer or refer to the Service Manual when servicing these items.
** : Medium weight wheel bearing grease.

NOTE:

Brake fluid replacement:

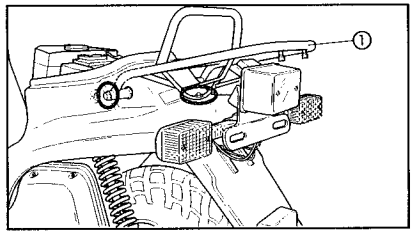
1. When disassembling the master cylinder or caliper cylinder, replace the brake fluid. Normally check the brake fluid level and add fluid as required.
2. On the inner parts of the master cylinder and caliper cylinder, replace the oil seals every two years.
3. Replace the brake hoses every four years, or when cracked or damaged.

COVERS

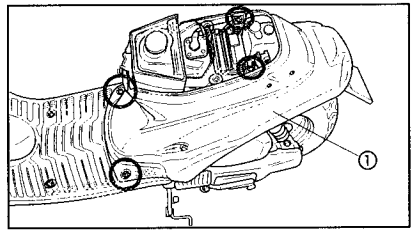


REMOVAL

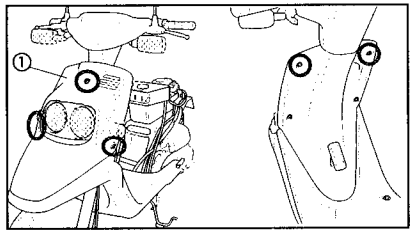
1. Remove:
   • Seat ①
   • Helmet holder ②



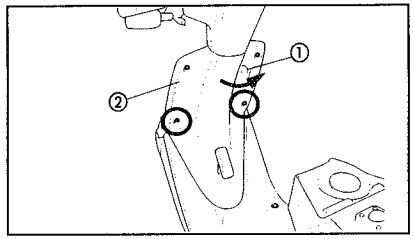
2. Disconnect:
   • Taillight leads
   • Flasher light leads
3. Remove:
   • Rear carrier ①
   • Washer



4. Remove:
   • Central cover ①



5. Remove:
   • Front cover ①
6. Disconnect:
   • Headlight leads

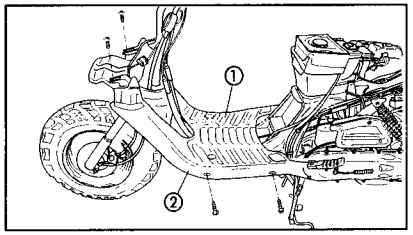


7. Remove:
   • Main switch cover ①

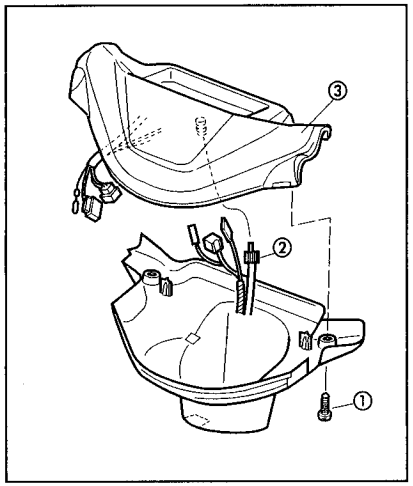
NOTE:

Turn the main switch cover counterclockwise and pull it out.

   • Front panel ②



8. Remove:
   - Footrest board ①
   - Bottom cover ②



9. Remove:
   - Screws (Handlebar cover) ①
10. Disconnect :
   - Speedometer cable ②
   - Couplers
11. Remove:
   - Handlebar cover (Upper) ③

INSTALLATION:

Reverse the "REMOVAL" procedure. Note the following points.

1. Connect:
   - Speedometer cable
   - Couplers

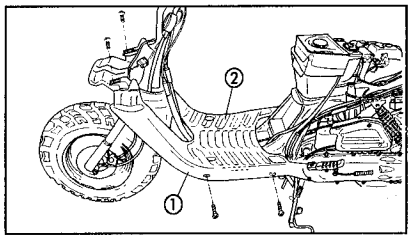
NOTE:

Correct routing of cables and wires is essential for a safe operation of this scooter. Refer to "CABLE ROUTING" in Chapter 2.

2. Install:
   - Handlebar cover

NOTE:

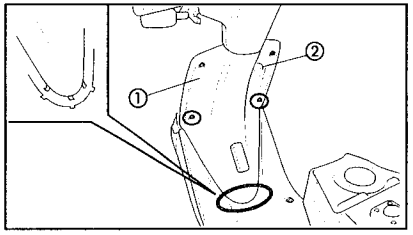
Be careful not to pinch any wires with the covers.



3. Install:
   - Bottom cover ①
   - Footrest board ②

NOTE:

Mesh the projections of footrest board and bottom cover.



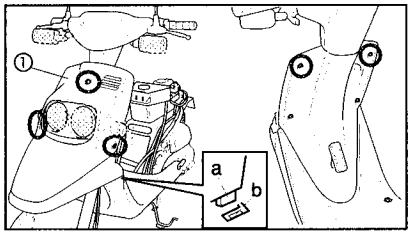
4. Install:
   - Front panel ①
   - Main switch cover ②

NOTE:

Insert the main switch cover and turn it clockwise.

NOTE:

Insert the projections of the front panel into the slot of the footrest board.

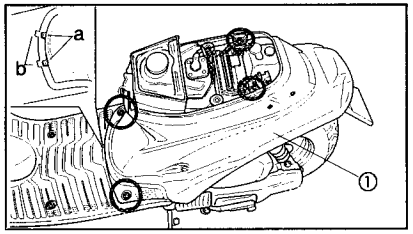


5. Connect:
   - Headlight leads

6. Install:
   - Front fender ①

NOTE:

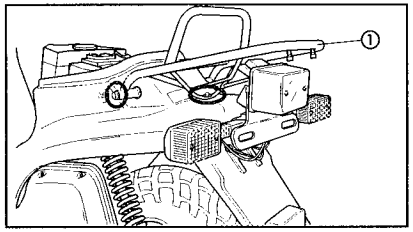
Insert the projection "a" of side cover into the slot "b" of footrest board.



7. Install:
   - Central cover ①

NOTE:

Insert the projection "a" of central cover into the slot "b" of footrest board.



8. Install:
   - Rear carrier ①
   - Helmet holder
   - Seat

NOTE:

After connecting the tail and flasher light lead, locate the couplers inside the rear fender.

Bolt (Rear carrier):
17 Nm (1.7 m.kg, 12.3 ft.lb)
Nut (Rear carrier):
15.5 Nm (1.55 m.kg, 11.21 ft.lb)
Nut (Seat):
8 Nm (0.8 m.kg, 5.8 ft.lb)

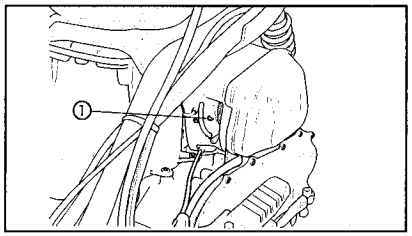
NOTE:

When installing the covers, be careful not to damage the mounting clips.

ENGINE IDLE SPEED ADJUSTMENT

INSP ADJ

B - 9



ENGINE

ENGINE IDLE SPEED ADJUSTMENT

1. Tighten:
   • Pilot air screw ①
   Turn the pilot air screw in until lightly seated.

2. Loosen:
   • Pilot air screw
   Back out from the lightly seated position.

Pilot air screw position:
1-5/8 turns out ± 1/4

3. Start the engine and let it warm up for several minutes.

⚠ WARNING

For safety reasons, place the scooter on the center stand before starting the engine.

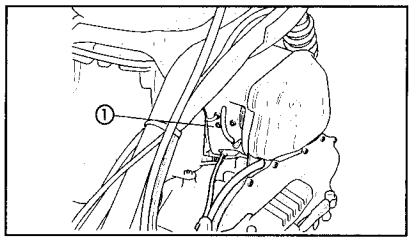
4. Attach:
   • Inductive tachometer
   (to the spark plug lead)

Inductive tachometer:
Ref: 90890-03113

5. Check:
   • Engine idle speed
   Out of specification → Adjust.

Engine idle speed :
1800 ± 200 r/min

6. Adjust:
   • Engine idle speed



****

Adjustment steps:

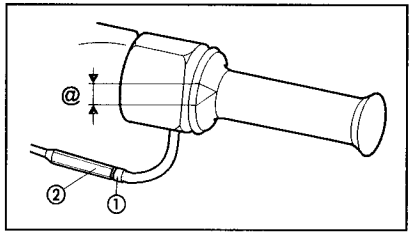
- Turn the throttle stop screw ① in or out until specified idling speed is obtained.

Turning left	**Idling speed increased.**
Turning right	**Idling speed decreased.**

****

THROTTLE CABLE FREE PLAY ADJUSTMENT

INSP ADJ



THROTTLE CABLE FREE PLAY ADJUSTMENT

1. Check:
   •Throttle cable free play @
   Out of specification → Adjust.

Free play @:
1.5 ~ 3.0 mm (0.06 ~ 0.12 in)

****

Throttle cable free play adjustment steps:

NOTE:

Before adjusting the throttle cable free play, the engine idle speed should be adjusted.

First step:

- Loosen the locknut ① on the throttle cable.
- Turn the adjuster ② in or out until the specified free play is obtained.

Turn in	**Free play increased.**
Turn out	**Free play decreased.**

- Tighten the locknut ①.

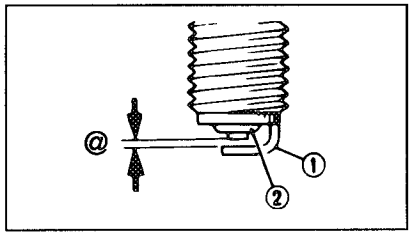
⚠ WARNING

After adjusting, turn the handlebar to the right and left, making sure that the engine idling speed does not change.

****

SPARK PLUG INSPECTION

INSP ADJ



SPARK PLUG INSPECTION

1. Remove:
   • Spark plug
2. Check:
   • Spark plug type
   Incorrect → Replace

Standard spark plug:
BR8HS (NGK)

3. Inspect:
   • Electrode ①
   Wear/Damage → Replace.
   • Insulator ②
   Abnormal color → Replace.
   Normal color is a medium-to-light tan color.

4. Measure:
   • Plug gap @
   Out of specification → Adjust gap.
   Use a wire gauge or feeler gauge.

Spark plug gap @:
0.5 ~ 0.7 mm (0.020 ~ 0.028 in)

5. Tighten:
   • Spark plug

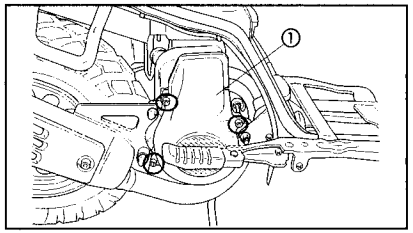
NOTE:
Before installing the spark plug, clean the gasket surface and plug surface.

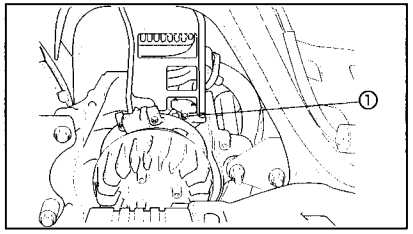
NOTE:
First tighten by hand, then torque to specification.

Spark plug:
20 Nm (2.0 m.kg, 14ft.lb)

AUTOLUBE PUMP AIR BLEEDING

INSP ADJ





AUTOLUBE PUMP AIR BLEEDING

1. Remove:
   • Fan cover ①

2. Bleed:
   • Pump housing and oil hose

****

Pump bleeding steps:

- Place a rag under the pump.
- Remove the bleed screw ①.
- Let oil run until there are no more air bubbles in it.
- When there are no more bubbles, tighten the bleed screw.

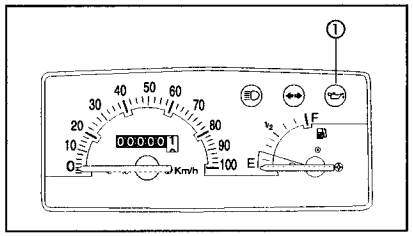
NOTE:
Check the condition of the bleed screw gasket. If it is damaged, replace it with a new one.

- Start the engine.
- Let the engine run two or three minutes at 2000 rpm. This will force out any air in the hose.

****

ENGINE OIL LEVEL INSPECTION

INSP ADJ

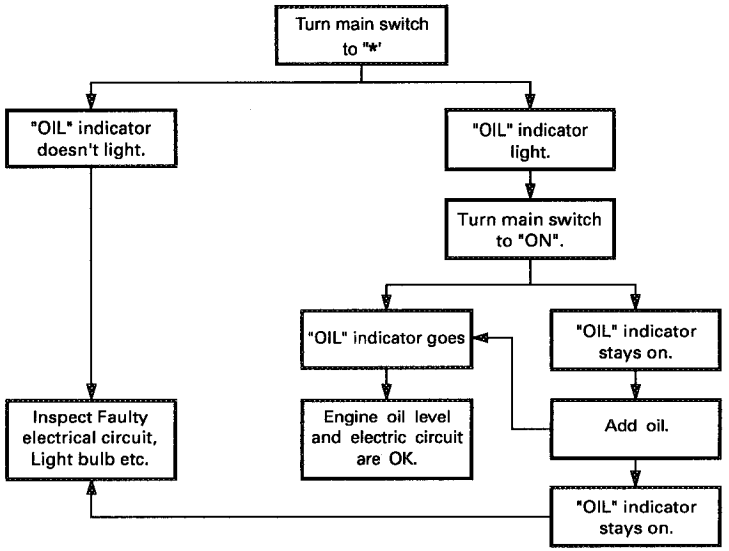


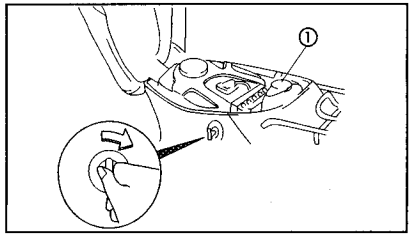
ENGINE OIL LEVEL INSPECTION

1. Inspect:
   • Oil level
   Oil level low → Add oil to proper level as follows.

① "OIL" indicator light

OIL LEVEL AND GAUGE CHECK





Recommended oil:
Semi-synthetic oil in accordance to the API TC TS C3 standard.
Capacity :
Total:
1.3 L (1.14 Imp qt, 1.37 US qt)

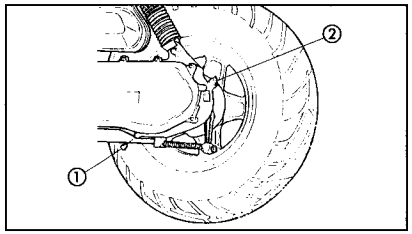
NOTE:
Install the oil tank filler cap ① and push it fully into the filler.

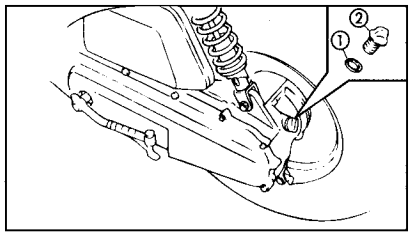
CAUTION:
Always use the same type of engine oil; mixing oils may result in a harmful chemical reaction and lead to poor performance.

B - 11

TRANSMISSION OIL REPLACEMENT

INSP ADJ





TRANSMISSION OIL REPLACEMENT

1. Remove :
   • Drain plug ①
   • Oil filler plug ②
   Drain the transmission oil.

2. Check:
   • Gasket (drain plug)
   • O-ring (oil filler plug)
   Damaged → Replace.

3. Install:
   • Gasket ①
   • Drain plug ②

Drain plug:
17.5 Nm (1.75 m.kg, 12.6 ft.lb)

4. Fill:
   • Transmission case

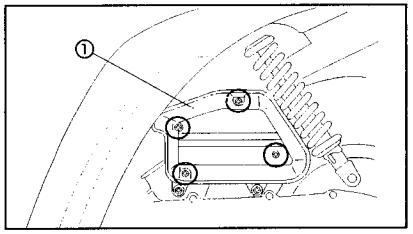
Transmission oil:
SAE 10W30 type SE motor oil.
Capacity:
Periodic replacement
0.11 L (0.10 Imp qt, 0.12 US qt)
Total amount
0.13 L (0.11 Imp qt, 0.13 US qt)

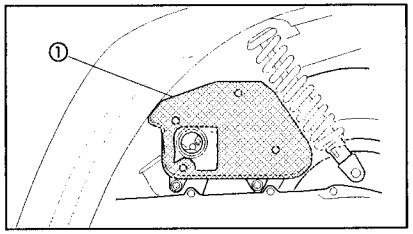
NOTE:
Wipe off any oil spilt on the crankcase, tire or wheel.

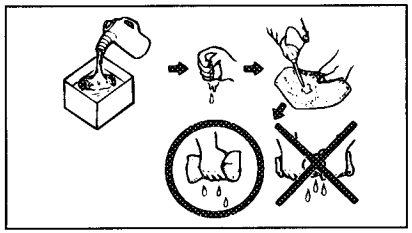
5. Install:
   • Oil filler plug

AIR FILTER ELEMENT CLEANING

INSP ADJ







AIR FILTER ELEMENT CLEANING

1. Remove:
   • Air cleaner case cover ①
2. Remove:
   • Air filter element

CAUTION:

Never operate the engine with the air cleaner element removed. Unfiltered air will cause rapid wear of engine parts and possible engine damage.

3. Inspect:
   • Element ①
   • Damage → replace.
4. Clean:
   • Air filter element

****

Cleaning steps:

- Wash the element gently but thoroughly in solvent.

⚠ WARNING

Never use low flashpoint solvents such as gasoline to clean the element. Such solvents may lead to fire or explosion.

- Squeeze excess solvent out of the element and let dry.

CAUTION:

Do not twist the element.

- Apply foam air filter oil or SAE 10W30 typ SE oil on the element.
- Sqeeze out the excess oil.

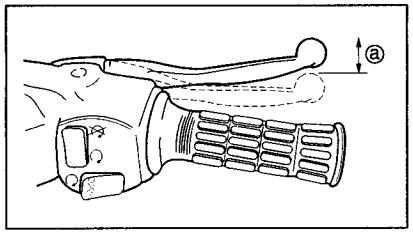
****

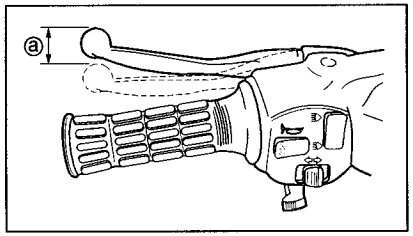
NOTE:

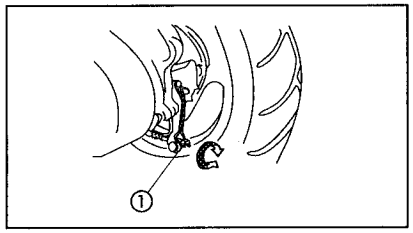
The element should be wet but not dripping.

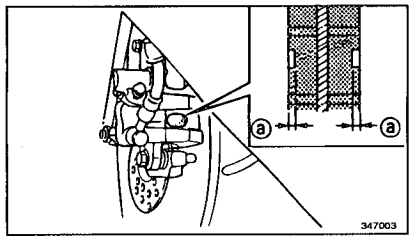
FRONT BRAKE LEVER FREE PLAY ADJUSTMENT/ REAR BRAKE LEVER FREE PLAY ADJUSTMENT/ BRAKE PAD INSPECTION

INSP ADJ









CHASSIS

FRONT BRAKE LEVER FREE PLAY ADJUSTMENT

1. Check:
   • Front brake lever free play ⓐ
   Out of specification → Adjust.

	Free play : 10 ~ 20 mm (0.4 ~ 0.8 in)

CAUTION:

A soft or spongy feeling in the brake lever can indicate the presence of air in the brake system. This air must be removed by bleeding the brake system before the scooter is operated. Air in the system will reduce brake performance and can result in loss of control and an accident. Inspect and bleed the system if necessary.

REAR BRAKE LEVER FREE PLAY ADJUSTMENT

1. Check:
   • Rear brake lever free play ⓐ
   Out of specification → Adjust.

	Free play: 10 ~ 20 mm (0.4 ~ 0.8 in)

2. Adjust:
   • Front brake lever free play

****

Adjustment steps:

- Turn the adjuster ① in or out until the specified free play is obtained.

****

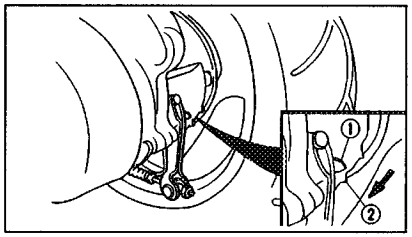
BRAKE PADS INSPECTION

1. Measure:
   • Brake pads ⓐ
   Out of specificatin → Replace brake pads.

NOTE:

Replace the brake pads and spring as a set when replacing the brake pads.

	Brake pads wear limit: 0.8 mm (0.03 in)



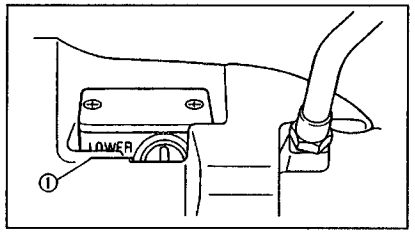
BRAKE SHOE INSPECTION

1. Apply the rear brake lever.

2. Inspect:
   • Wear indicator ①
   Indicator reaches the wear limit line ② → Replace brake shoes.

BRAKE FLUID LEVEL INSPECTION

NOTE:
Position the scooter straight up when inspecting the fluid level, and make sure be turning the handlebar that the top of the master cylinder is horizontal.

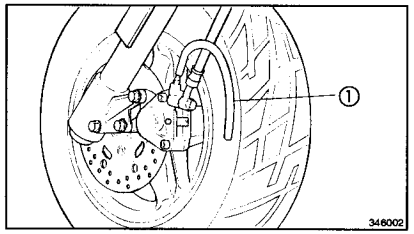


1. Inspect:
   • Brake fluid level
   Brake fluid level is under "LOWER" level line ① → Fill to proper level.

Recommended brake fluid:
DOT # 3 or DOT # 4

CAUTION:
The brake fluid may corrode painted surfaces or plastic parts. Always clean up spilled fluid immediately.

WARNING
• Use only the designated quality fluid. Otherwise, the rubber seals may deteriorate causing leakage and poor brake performance.
• Refill with the same type of fluid. Mixing fluids may result in a harmful chemical reaction leading to poor brake performance.
• Be careful that water does no enter the master cylinder when refilling. Water will significantly lower the boiling point of the fluid and may result in vapor lock.



AIR BLEEDING
(HYDRAULIC BRAKE SYSTEM)

1. Bleed:
   • Brake fluid.

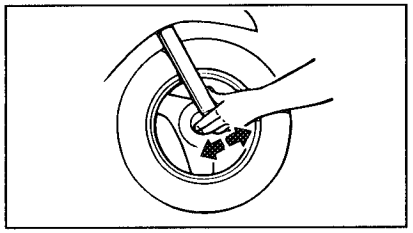
****

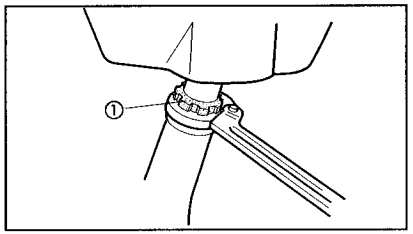
Air bleeding steps:

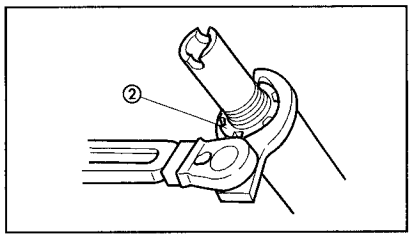
a. Add proper brake fluid into the reservoir.
b. Install the diaphragm. Be careful not to spill any fluid or allow the reservoir to overflow.
c. Connect a clear plastic tube ① tightly to the caliper bleed screw.
d. Place the other end of the tube into a container.
e. Slowly apply the brake lever several times.
f. Pull the lever as far as possible and hold it there.
g. Loosen the bleed screw and pull the lever all the way.
h. When the lever is completely pulled, tighten the bleed screw, then release the lever.
i. Repeat steps (e) to (h) until all air bubbles have been removed from the system.
j. Add brake fluid to proper level.

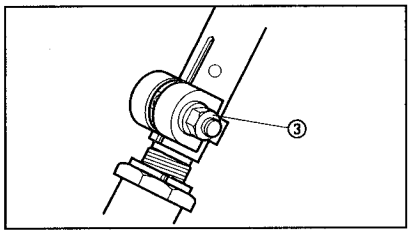
WARNING
Check the operation of the brake after bleeding the brake system.

****









STEERING HEAD ADJUSTMENT

1. Check:
   - Steering assembly bearings
   Grasp the bottom of the forks and gently rock the fork assembly back and forth.
   Looseness → Adjust steering head.

****

Steering head adjustment steps:

- Remove the front fender and the front panel.

Refer to "COVERS" section.

- Unscrew the securing nut
- Tighten the nut ①

Steering head wrench:
Ref : 90890-01268
Ref : 90890-01403

NOTE:

Tighten the ring nut until no play can be seen.

- Install the securing nut
- Tighten the securing nut ①

Securing nut:
22.5 Nm (2.25 m.kg, 16.2 ft.lb)

NOTE:

Set the torque wrench ② to the ring nut wrench so that they form a right angle.

- Move the handlebar up and down, and / or back and forth. If the handlebar free play is excess, tighten the bolt ③ to the specified torque.

Handlebar securing bolt:
60 Nm (6.0 m.kg, 43.4 ft.lb)

- Instal the front panel and front fender.

****

TIRE INSPECTION

1. Measure:
   - Air pressure
   Out of specification → Adjust.

⚠ WARNING

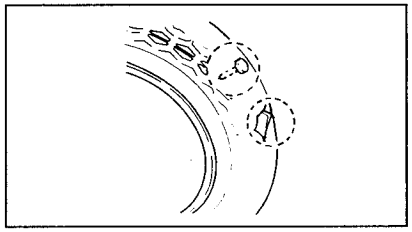
Proper loading of your scooter is important for the handling, braking, and other performance and safety characteristics of your scooter. Do not carry loosely packed items that can shift.

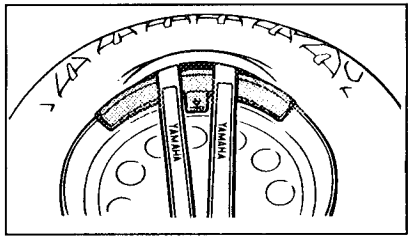
Securely pack your heaviest items close to the center of the scooter, and distribute the weight evenly from side to side. And check the condition and pressure of your tires. NEVER OVERLOAD YOUR SCOOTER.

Make sure the total weight of the cargo, rider, passenger, and accessories (fairing, saddlebags, etc. if approved for this model) does not exceed the maximum load of the scooter. Operation of an overloaded scooter could cause tire damage, an accident, or even injury.

Tire pressure (cold)	Front	Rear
Up to 90 kg	100 kPa (1.00 kgf/cm², 15 psi)	125 kPa (1.25 kgf/cm², 18 psi)
90 kg ~ maximum load *	100 kPa (1.00 kgf/cm², 15 psi)	150 kPa (1.50 kgf/cm², 21 psi)
Maximum load:	152 kg (335 lb)	

* Maximum load is the total weight of cargo, rider, passenger and accessories.



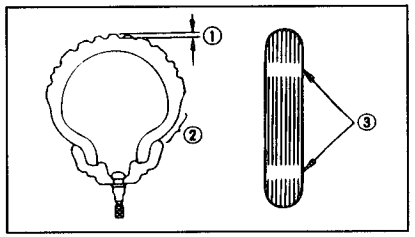


2. Inspect:
   - Tire surface
   Wear/Damage/Cracks/Road hazards → Replace.
   - Wheels
   Damage/Bends → Replace.
   Never attempt even small repairs to the wheel.

⚠ WARNING

Ride conservatively after installing a tire to allow it to seat itself properly on the rim.

- If the tire is removed with a tire lever, use a suitable protection to prevent damaging the rim.
- When installing the tire, make sure the arrow points to the front.



3. Measure:
   • Tire tread depth
   Out of specification → Replace.

Minimum tire tread depth (front and rear): 0.8 mm (0.03 in)

① Tread depth
② Side wall
③ Wear indicator

WHEEL INSPECTION

1. Inspect:
   • Wheels
   Damage/Bends → Replace.

⚠ WARNING

Never attempt even small repairs to the wheel.

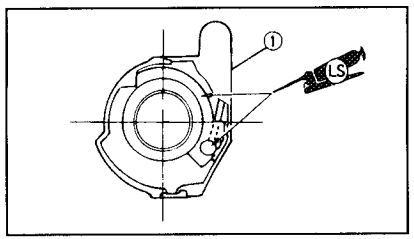
CABLE INSPECTION AND LUBRICATION

⚠ WARNING

A damaged cable sheath will rapidly corrode. As a result, the cable cannot move smoothly inside the sheath. Since this situation is dangerous, replace a damaged cable immediately.

1. Check:
   • Cable sheath
   • Cable end
   Damage → Replace.
2. Check:
   • Cable movement
   Stickness → Lubricate.

Recommended lubricant: Engine oil SAE 10W30



NOTE:

Hold the cable end up and pour a few drops of oil into the sheath.

3. Lubricate the throttle cable end and the cable guide notch on the throttle grip with grease ①.

Recommended lubricant: Lithium soap based grease

LEVER LUBRICATION

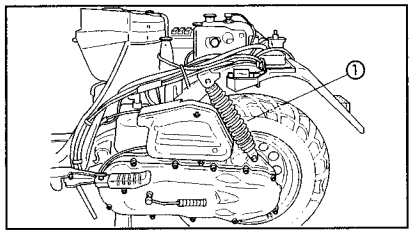
1. Lubricate rotating parts of the levers

Recommended lubricant: Engine oil SAE 10W30

CENTERSTAND LUBRICATION

1. Lubricate rotating parts

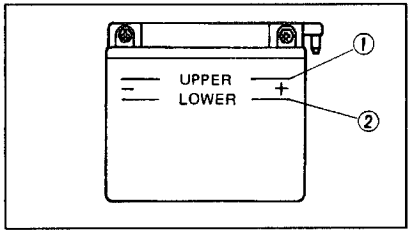
Recommended lubricant: Engine oil SAE 10W30



REAR SHOCK ABSORBER

1. Check:
   • Rear shock absorber ①
   Oil leaks/Damage → Replace.
2. Check:
   • Tightening torque

Upper bolt: 31.5 Nm (3.15 m.kg, 22.8 ft.lb)
Lower bolt: 17.5 Nm (1.75 m.kg, 12.6 ft.lb)



ELECTRICAL

BATTERY INSPECTION

1. Inspect:
   • Battery fluid level
   Fluid level low → Add to proper level.
   Fluid level should be between upper and lower level marks.
   ① Upper level
   ② Lower level

CAUTION:

Refill with distilled water only. Tap water contains minerals which are harmful to a battery.

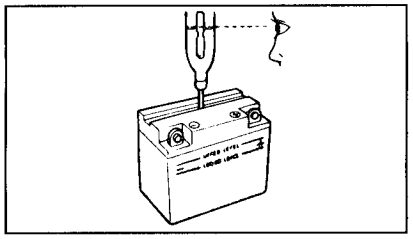
2. Inspect:
   • Breather hose
   Obstruction → Remove.
3. Inspect:
   • Battery

****

Replace the battery if:

- Battery voltage will not rise to a specific value or bubbles fail to rise during charging.
- Sulfation of one or more cells occurs. (As indicated by the plates turning white, or an accumulation of material in the bottom of the sell.)
- Specific gravity readings after a long, slow charge indicate that one cell is lower than the rest.
- Warpage or buckling of plates or insulators is evident.

****



4. Measure:
   • Specific gravity
   Less than 1.280 → Recharge battery.

Charging Current:
0.4 amps/10 hrs
Specific Gravity:
1.280 at 20°C (68° F)

CAUTION:

Always charge a new battery before using it to ensure maximum performance.

⚠ WARNING

Battery electrolyte is dangerous. It contains sulfuric acid which is poisonous and highly caustic.
Always follow these preventive measures:

- **Avoid bodily contact with electrolyte as it can cause severe burns and permanent eye injury.**
- **Wear protective eye gear when handling or working near batteries.**

Antidote (EXTERNAL) :

- **SKIN – Flush with water.**
- **EYES – Flush with water for 15 minutes and get immediate medical attention.**

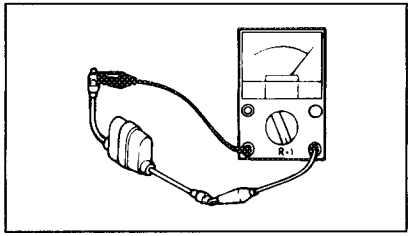
Antidote (INTERNAL) :

- **Drink large quantities of water or milk. Follow with milk of magnesia, beaten egg, or vegetable oil. Get immediate medical attention.**

Batteries generate explosive hydrogen gas.
Always follow these preventive measures:

- **Charge batteries in a well-ventilated area.**
- **Keep batteries away from fire, sparks, or open flames (e.g., welding equipment, lighted cigarettes, etc.)**
- **DO NOT SMOKE when charging or handling batteries.**

KEEP BATTERIES AND ELECTROLYTE OUT OF REACH OF CHILDREN.



FUSE INSPECTION

1. Open the seat.
2. Inspect:
   • Fuse
   Blown → Replace.

****

Fuse replacement steps:

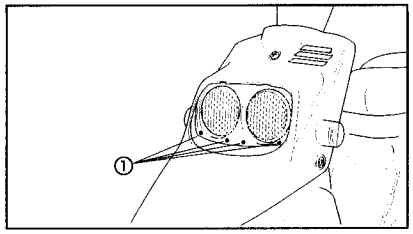
- Turn off the ignition.
- Install a new fuse of the right amperage.
- Turn on the switches to verify the operation of the electric circuit.
- If the fuse immediately blows again, check the electric circuit.

⚠ WARNING

Never use a fuse with a rating higher than specified. An improper fuse may cause damage to the electrical circuit, and possibly cause a fire.

****

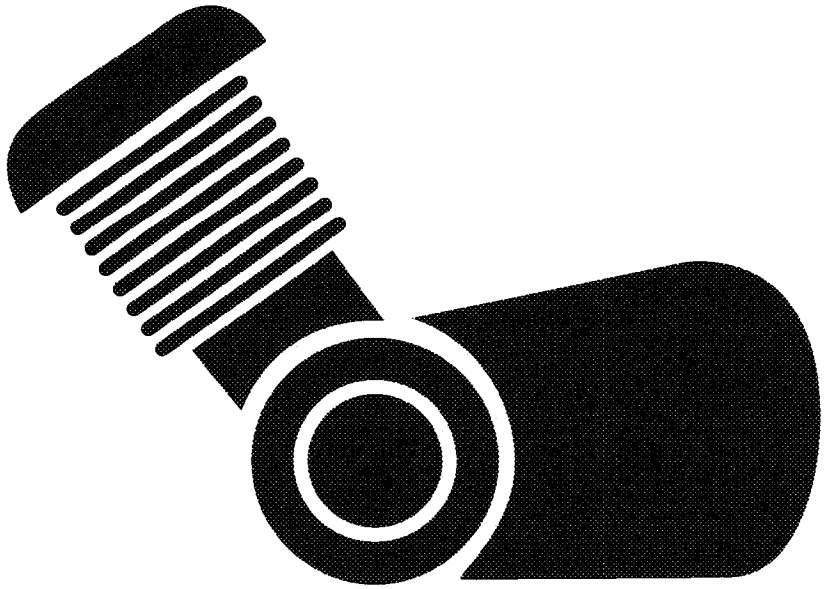
Fuse :
Main circuit: 7A



HEADLIGHT BEAM ADJUSTMENT

1. Adjust:
   - Headlight beam

Higher	**Turn out screw ①**
Lower	**Turn in screw ①**



ENG 4

ENG

CHAPTER 4.
ENGINE OVERHAUL

ENGINE REMOVAL C-5
COVER REMOVAL C-5
CARBURETOR C-5
CABLES, LEADS AND HOSES C-5
ENGINE REMOVAL C-6

ENGINE DISASSEMBLY C-6
REAR WHEEL C-6
CENTER STAND C-6
CYLINDER HEAD AND CYLINDER C-6
PISTON PIN AND PISTON C-6
KICK STARTER C-7
PRIMARY SHEAVE C-7
SECONDARY SHEAVE C-7
STARTER SYSTEM C-8
TRANSMISSION C-8
CDI MAGNETO C-8
AUTOLUBE OIL PUMP C-9
CRANKCASE AND CRANKSHAFT C-9

INSPECTION AND REPAIR C-10
CYLINDER HEAD C-10
CYLINDER AND PISTON C-10
PISTON RINGS C-11
PISTON PIN AND PISTON PIN BEARING C-11
KICK STARTER C-12
TRANSMISSION C-12
AUTOLUBE PUMP C-12
CRANKSHAFT C-12
PRIMARY SHEAVE C-12
SECONDARY SHEAVE C-13
V-BELT C-13
STARTER CLUTCH AND GEARS C-14

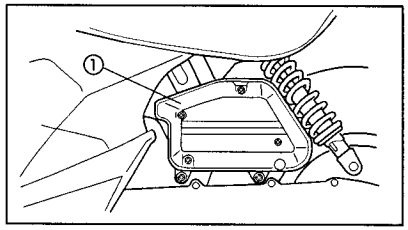
ENGINE ASSEMBLY AND ADJUSTMENT C-14
CRANKSHAFT AND CRANKCASE C-14
AUTOLUBE PUMP C-16
CDI MAGNETO C-16
TRANSMISSION D-1
STARTER SYSTEM D-2
SECONDARY SHEAVE D-4
PRIMARY SHEAVE D-5
KICK STARTER D-6
PISTON PIN AND PISTON D-7
CYLINDER AND CYLINDER HEAD D-7
ENGINE REMOUNTING D-8

ENGINE OVERHAUL

ENGINE REMOVAL

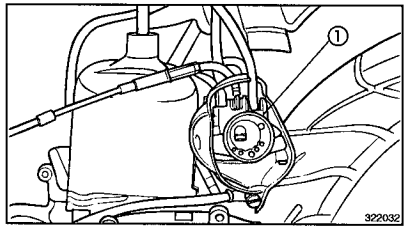
COVER REMOVAL

1. Remove:
   • Covers
   Refer to "COVERS" in CHAPTER 3.



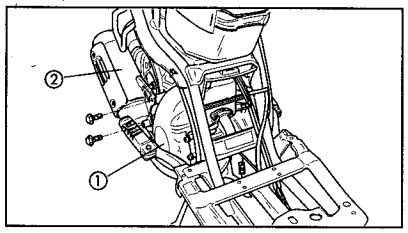
CARBURETOR

1. Remove:
   • Air cleaner case assembly ①

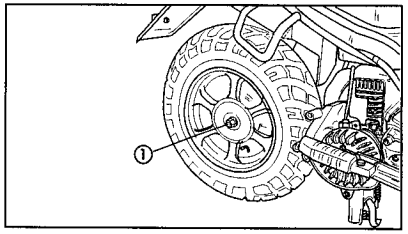


2. Disconnect:
   • Carburetor cover
   • Hoses
   • Carburetor top

3. Remove:
   • Carburetor ①

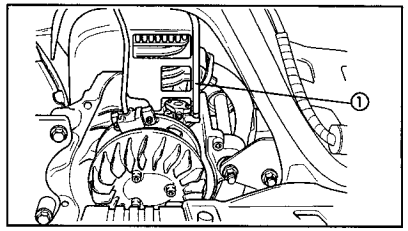


4. Remove:
   • Exhaust protector
   • Air shroud ①
   • Muffler assembly ②



5. Loosen:
   • Rear axle nut ①

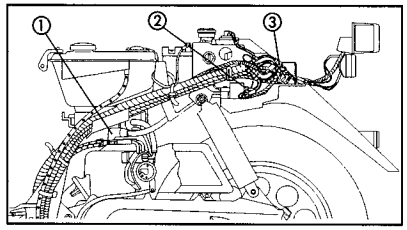
NOTE:
Apply the rear brake while loosening the rear axle nut.



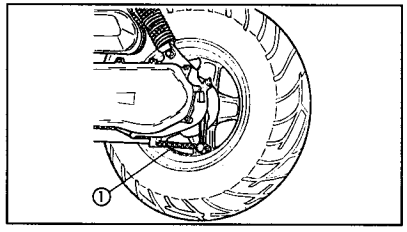
CABLES, LEADS AND HOSES

1. Remove:
   • Oil hose ① on oil pump side

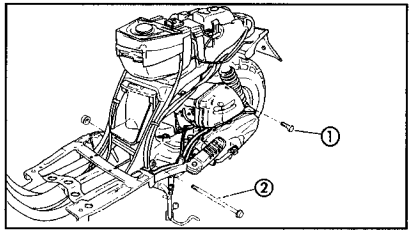
NOTE:
Plug the hose to prevent oil spillage.



2. Disconnect:
   • Earth (ground lead)
   • Spark plug cap ①
   • Starter motor lead ②
   • CDI magneto lead ③



3. Remove:
   • Rear brake cable ①

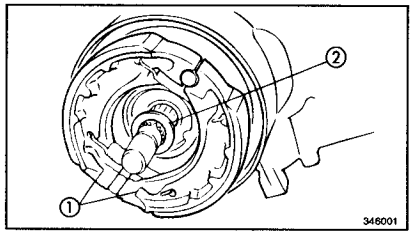


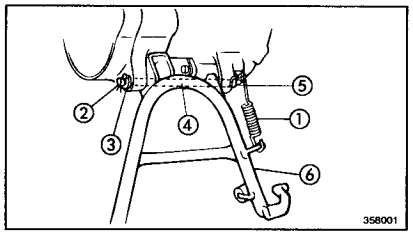
ENGINE REMOVAL

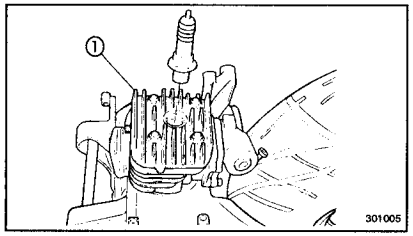
1. Place a suitable stand under the frame.
2. Remove:
   - Left pillion footrest
   - Rear shock absorber bolt (lower) ①
   - Engine mounting bolt ②
3. Remove:
   - Engine

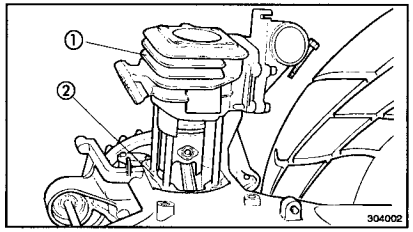
NOTE:
Lift up the frame and remove the engine.

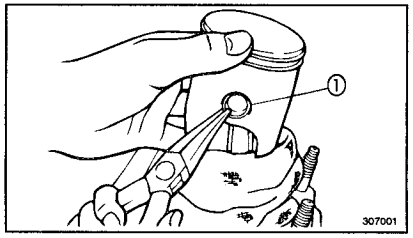
4. Place the frame on a suitable stand.











ENGINE DISASSEMBLY

REAR WHEEL

1. Remove:
   - Rear wheel nut
   - Rear wheel washer
   - Rear wheel
   - Brake shoes ①
   - Plate washer ②

CENTERSTAND

1. Remove:
   - Spring ①
   - Clip ②
   - Rubber washer ③
   - Axle ④
   - Clamp ⑤
   - Center stand ⑥

CYLINDER HEAD AND CYLINDER

1. Remove:
   - Air shroud
   - Cylinder head ①
   - Cylinder head gasket

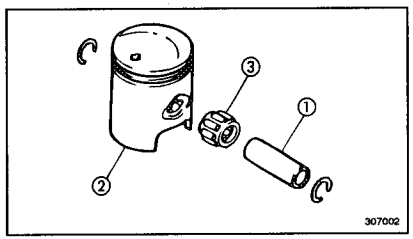
NOTE:
- Before loosening the cylinder head nuts, loosen the spark plug.
- Loosen the cylinder head nuts crosswise 1/4 of a turn each before removing them.

2. Remove:
   - Cylinder ①
   - Cylinder gasket ②

PISTON PIN AND PISTON

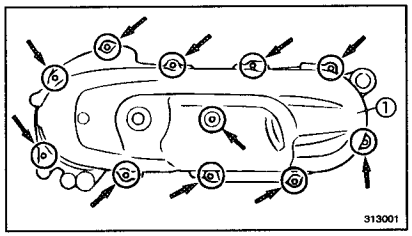
1. Remove:
   - Piston pin clip ①

NOTE:
Before removing the piston pin clip, cover the crankcase with a clean rag, so that the clip cannot accidentally fall into the crankcase.



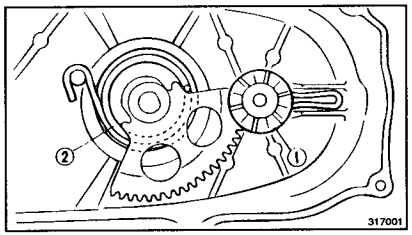
2. Remove:
   - Piston pin ①
   - Piston ②
   - Piston pin bearing ③

CAUTION:
Do not use a hammer to drive out the piston pin.



KICKSTARTER

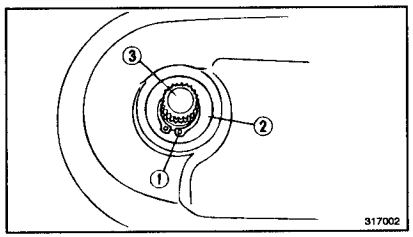
1. Remove:
   - Kick crank
   - Transmission cover ① (left)



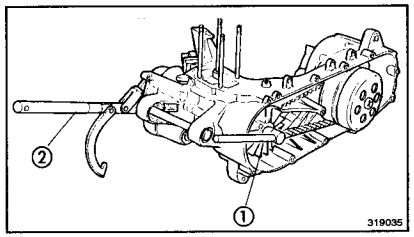
2. Remove:
   - Kick pinion gear ①

NOTE:
To remove the kick pinion gear, push down the kick crank.

3. Unhook:
   - Kick return spring ②



4. Remove:
   - Circlips ①
   - Plate washer ②
   - Kick shaft ③

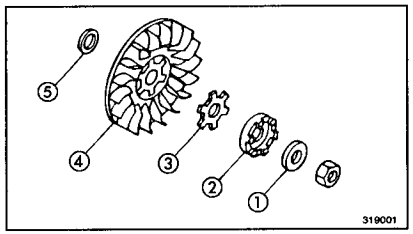


PRIMARY SHEAVE

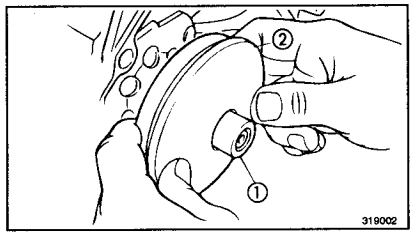
1. Remove:
   - Fan
2. Remove:
   - Nut ① (primary sheave)

NOTE:
To loosen the primary sheave nut hold the CDI magneto with a flywheel holder ②.

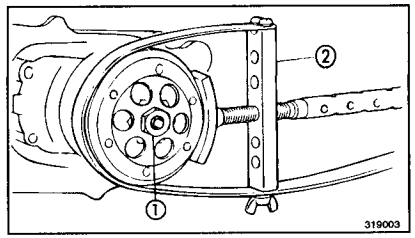
	Flywheel holder: 90890-01235



3. Remove:
   - Washer ①
   - Ratchet ②
   - Washer ③
   - Fixed primary sheave ④
   - Washer ⑤
   - V-belt



4. Remove:
   - Spacer ①
   - Primary sliding sheave ②

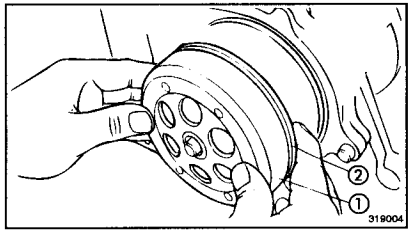


SECONDARY SHEAVE

1. Remove:
   - Nut ① (secondary sheave)

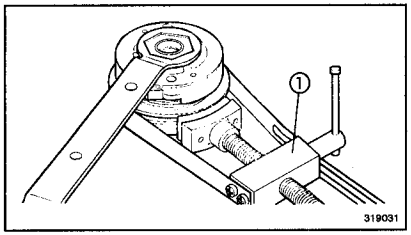
NOTE:
Hold the secondary sheave with a sheave holder ② to loosen the nut.

	Sheave holder: 90890-01701



2. Remove:
   - Clutch housing ①
   - Secondary sheave ②
   - Crankcase cover gasket
   - Dowel pins
3. Attach:
   - Sheave holder ①
   - Nut wrench (41 mm)

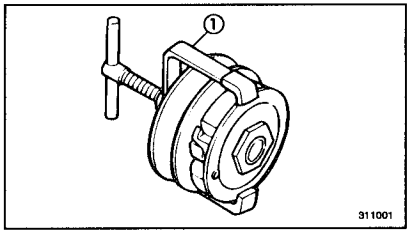
Sheave holder:
90890-01701



4. Loosen:
   - Clutch securing nut

⚠ WARNING

Loosen the nut but do not remove it yet.

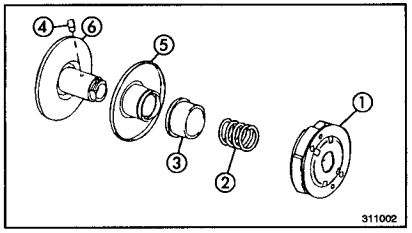


5. Attach:
   - Clutch spring holder ①

NOTE:

Compress the secondary sheave using the clutch spring holder ①.

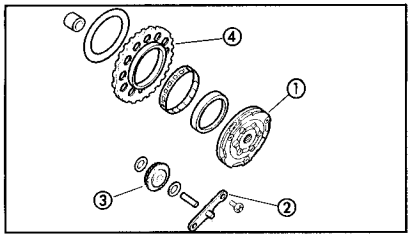
Clutch spring holder:
90890-01337

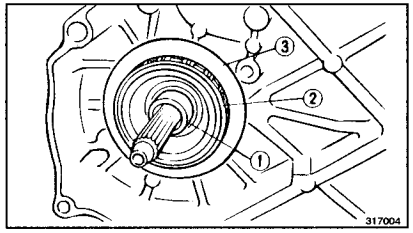


6. Remove:
   - Clutch securing nut
7. Remove:
   - Clutch assembly ①
   - Clutch spring ②
   - Spring seat ③
   - Guide pin ④
   - Secondary sliding sheave ⑤
   - Secondary fixed sheave ⑥

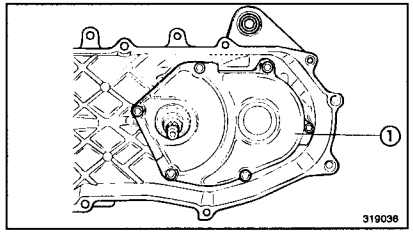
STARTER SYSTEM

1. Remove:
   - Starter clutch assembly ①
   - Plate ② (idle gear)
   - Idle gear ③
   - Starter wheel gear ④



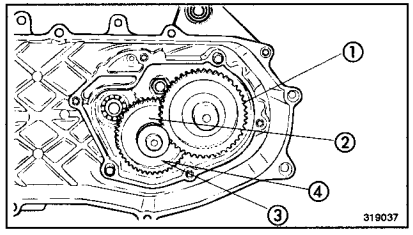


2. Remove:
   - Spacer ①
   - Bearing ②
   - Washer ③
   - Starter motor

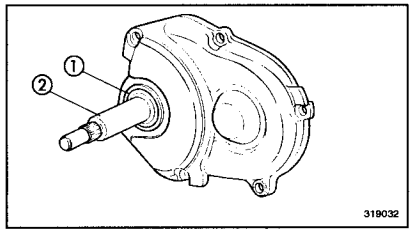


TRANSMISSION

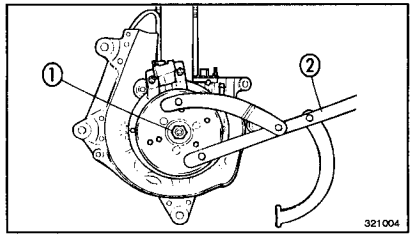
1. Remove:
   - Transmission case ①
   - Gasket
   - Dowel pins



2. Remove:
   - Main shaft ①
   - Drive shaft ②
   - Plate washer ③
   - Conical spring washer ④



3. Remove:
   - Oil seal ①
   - Secondary sheave axle ②



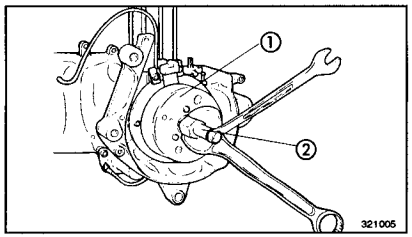
CDI MAGNETO

1. Remove:
   - Nut ① (rotor)
   - Plate washer

NOTE:

Hold the rotor using the flywheel holder ② to loosen the nut.

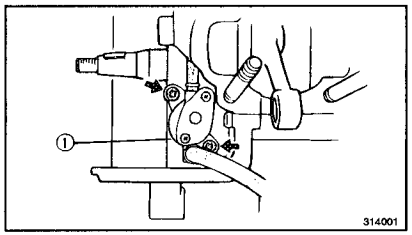
Flywheel holder:
90890-01235



2. Remove:
   • Rotor ①
   • Woodruff key
   Use the flywheel puller ②

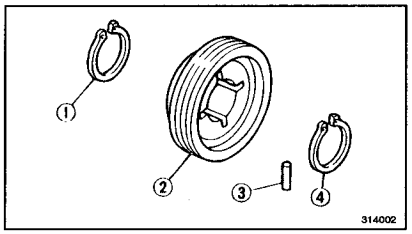
	Flywheel puller: 90890-01189

   • Stator assembly
   • Gasket

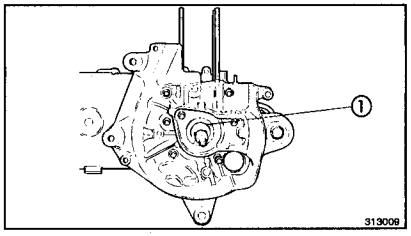


AUTOLUBE OIL PUMP

1. Remove:
   • Autolube oil pump ①



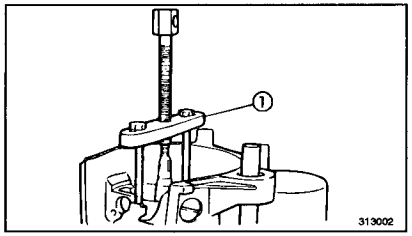
2. Remove:
   • Circlips ①
   • Pump drive gear ②
   • Pin ③
   • Circlip ④



CRANKCASE AND CRANKSHAFT

1. Remove:
   • Oil seal stopper ①
   • Screws (crankcase)

NOTE:
Loosen each screw one quart of a turn before beginning to remove them.



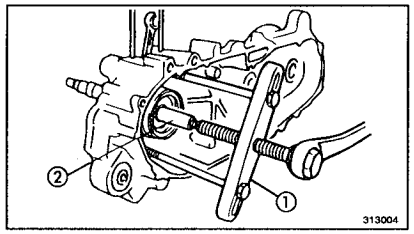
2. Attach:
   • Crankcase separating tool ①

	Crankcase separating tool: 90890-01135

NOTE:
Fully tighten the tool holding bolts. Insure that the tool body is parallel with the case. If necessary, loosen one screw as much as required to level the tool body.

3. Remove:
   • Crankcase (right)
   As pressure is applied, keep tapping carefully on the engine mounting bosses.

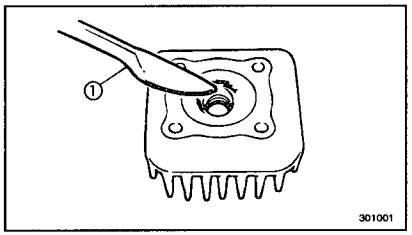
CAUTION:
Use a soft hammer to tap on the case. Tap only on reinforced spots of the case. Never tap on the gasket mating surfaces. Work slowly and carefully. Make sure the cases separate evenly. If one end "hangs up" take the pressure off the push screw, realign the cases and the tool and start again. If the cases do not separate at all, check for a remaining case screw or fitting. Do not force.

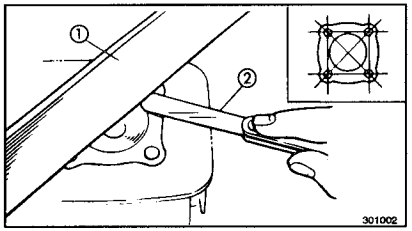


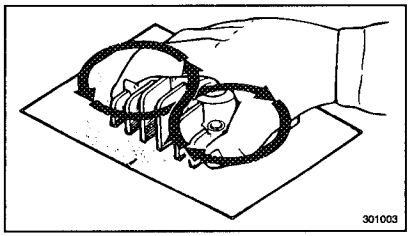
4. Attach:
   • Crankcase separating tool ①

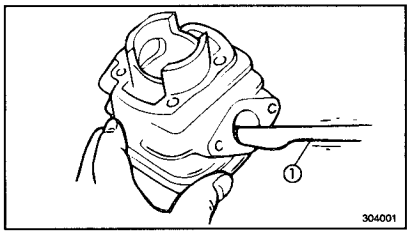
	Crankcase separating tool: 90890-01135

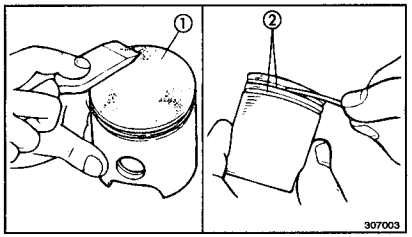
5. Remove:
   • Crankshaft ②











INSPECTION AND REPAIR

CYLINDER HEAD

1. Eliminate:
   • Carbon deposits
   Use a rounded scraper ①

NOTE:
Take care to avoid damaging the spark plug threads. Do not use a sharp instrument. Avoid scratching the aluminium.

2. Inspect:
   • Cylinder head warpage
   Out of specification → Resurface.

****

Warpage measurement and re-surfacement steps:

- Attach a straight edge ① and a thickness gauge ② to the cylinder head.
- Measure the warpage limit.

	Warpage limit: 0.03 mm (0.0012 in)

- If the warpage is out of specification, resurface the cylinder head.

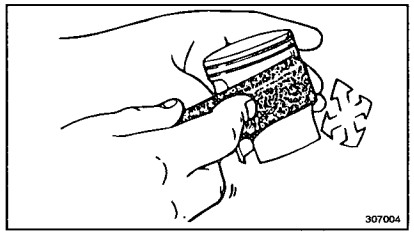
NOTE:
Rotate the head several times to avoid removing too much material from one side.

****

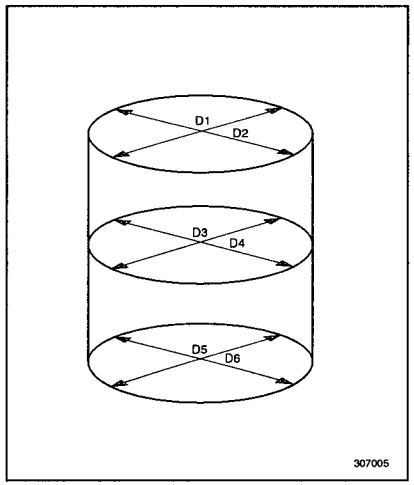
CYLINDER AND PISTON

1. Eliminate:
   • Carbon deposits
   Use a rounded scraper ①
2. Inspect:
   • Cylinder wall
   Wear/Scratches → Replace.
3. Eliminate:
   • Carbon deposits
   From the piston crown ① and ring grooves ②.
4. Remove:
   • Score marks and lacquer deposits
   From the sides of piston.

NOTE:
Sand in a crisscross pattern. Do not sand excessively.



5. Inspect:
   • Piston wall
   Wear/Scratches/Damage → Replace.



6. Measure:
   • Piston to cylinder clearance

****

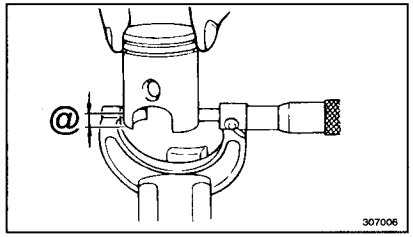
Piston to cylinder clearance measurement steps:
First step:

- Measure the cylinder bore "C" with a cylinder bore gauge.

NOTE:
Measure the cylinder bore "C" in parallel to and at right angles to the crankshaft. Then, calculate the average of the measurements.

	Standard	Wear limit
Cylinder Bore "C"	39.993 ~ 40.012mm (1.574 ~ 1.575 in)	40.10 mm (1.579 in)
Taper "T"	–	0,006 mm (0.0002 in)
C = Maximum D T = (Maximum D_1,D_3 or D_5) - (Maximum D_2,D_4 or D_6)		

- If out of specification, replace cylinder, piston and piston rings as a set.



2nd step:

- Measure the piston skirt diameter "P" with a micrometer.

@ 5 mm (0.2 in) from the piston bottom edge.

	Piston Size: Standard: 39.952 ~ 39.972 mm (1.573 ~ 1.574 in)

- If out of specification, replace piston and piston rings as a set.

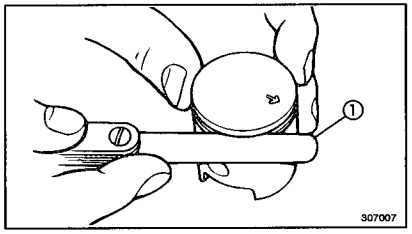
3rd step:
- Calculate the piston-to-cylinder clearance with following formula:

Piston-to cylinder clearance =
Cylinder Bore "C" –
Piston Skirt Diameter "P"

- If out of specification, replace cylinder, piston and piston rings as a set.

Piston-to-cylinder clearance:
0.034 ~ 0.047 mm
(0.0013 ~ 0.0018 in)
Wear limit : 0.1 mm (0.004 in)

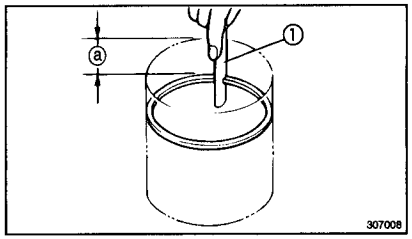
****



PISTON RINGS

1. Measure:
   • Side clearance
   Out of specification → Replace piston and/or rings.
   Use a Feeler Gauge ①

	Standard	Limit
Top ring	0.03 ~ 0.05 mm (0.0012 ~ 0.0020 in)	0.10 mm (0.004 in)
2nd ring	0.03 ~ 0.05 mm (0.0012 ~ 0.0020 in)	0.10 mm (0.004 in)



2. Install:
   • Piston ring
   • Into the cylinder
   Push the ring with the piston crown.

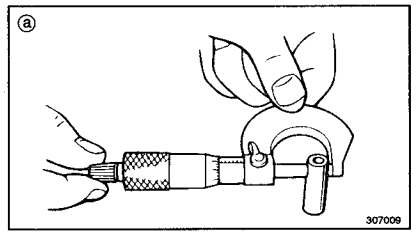
3. Measure:
   • End gap
   Out of specification → Replace rings as a set.
   Use a feeler gauge ①

	Standard	Limit
Top ring	0.15 ~ 0.30 mm (0.006 ~ 0.012 in)	0.70 mm (0.028 in)
2nd ring	0.15 ~ 0.30 mm (0.006 ~ 0.012 in)	0.70 mm (0.028 in)

@ Measuring Point 20 mm (0.8 in)

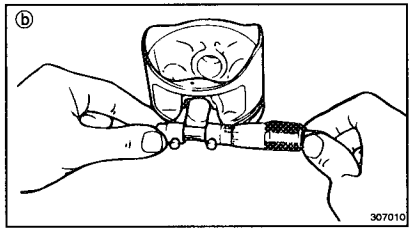
PISTON PIN AND PISTON PIN BEARING

1. Inspect:
   • Piston pin
   Blue discoloration/Groove → Replace, then inspect lubrication system.



2. Measure:
   • Outside diameter (piston pin)
   Out of specification → Replace.

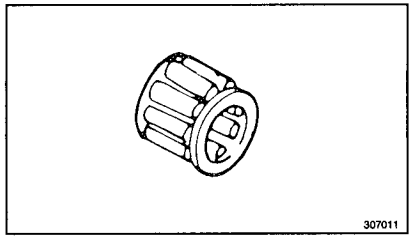
Outside diameter (piston pin):
9.996 ~ 10.000 mm
(0.3935 ~ 0.3937 in)



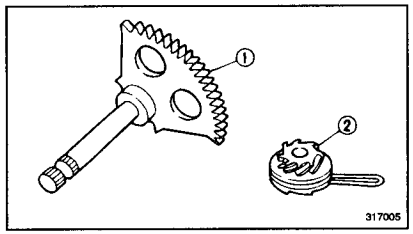
3. Measure:
   • Piston pin-to-piston clearance
   Out of specification → Replace piston.

Piston pin-to-piston clearance =
Bore (piston pin) b -
Outside diameter (piston pin) a

Piston pin-to-piston clearance:
0.004 ~ 0.019 mm
(0.0002 ~ 0.0008 in)
<Limit: 0.07 mm (0.028 in)>



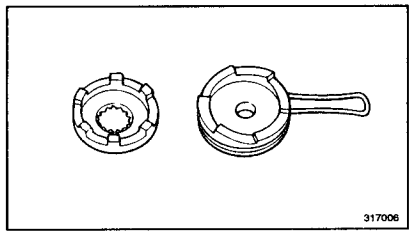
4. Inspect:
   • Bearing (piston pin)
   Pitting/Damage → Replace



KICK STARTER

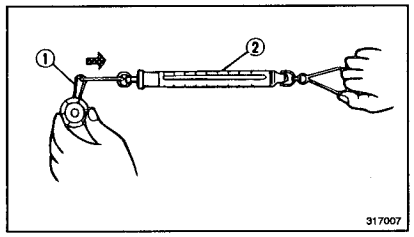
1. Inspect:
   - Kick gear teeth ①
   - Kick pinion gear teeth ②

   Burrs/Chips/Roughness/Wear → Replace.



2. Inspect:
   - Mating dogs (kick pinion gear and one-way clutch)

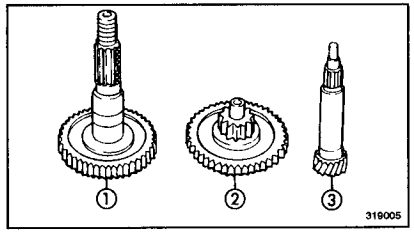
   Rounded edges/Damage → Replace.



3. Measure:
   - Clip tension (kick pinion gear) ①

   Out of specification → Replace.
   Use a spring balance ②.

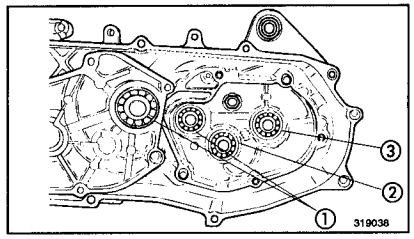
Standard tension:
150 ~ 250 g (5.3 ~ 8.8 oz.)



TRANSMISSION

1. Inspect:
   - Drive axle ①
   - Main axle ②
   - Secondary sheave axle ③

   Burrs/Chips/Roughness/Wear → Replace.



2. Inspect:
   - Secondary sheave axle bearing ①
   - Main axle bearing ②
   - Drive axle bearing ③

   Spin the bearing inner race.
   Excessive play/Roughness → Replace.
   Pitting/Damage → Replace.

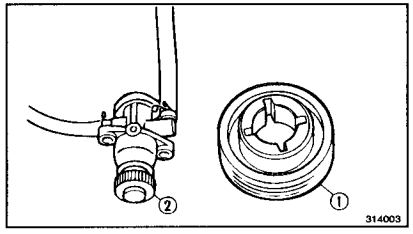
AUTOLUBE PUMP

Wear or an internal malfunction may cause the pump output to vary from the factory setting. This situation is, however, extremely rare. If improper output is suspected, inspect the following:

1. Inspect:
   - Delivery line

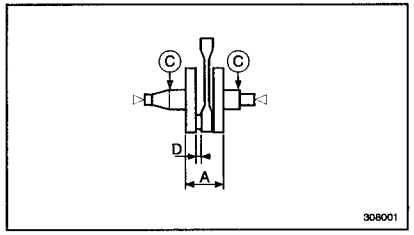
   Obstructions → Blow out.
   - O-ring

   Wear/Damage → Replace.



2. Inspect:
   - Autolube pump drive gear teeth ①
   - Autolube pump driven gear teeth ②

   Pitting/Wear/Damage → Replace.

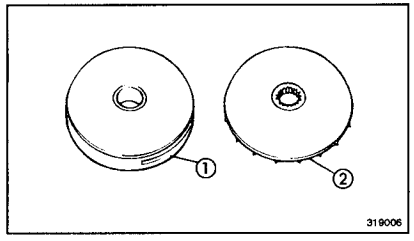


CRANKSHAFT

1.Measure:
- Crankshaft width "A"
- Runout limit "C"
- Connecting rod big end side clearance "D"

Use V-blocks, dial gauge and thickness gauge.

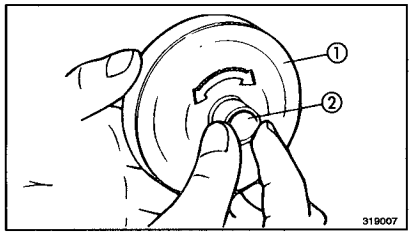
Crankshaft width "A":
37.90 ~ 37.95 mm
(1.492 ~ 1.494 in)
Runout limit "C":
0.03 mm (0.0012 in)
Connecting rod big end side clearance "D":
0.2 ~ 0.5 mm (0.008 ~ 0.020 in)



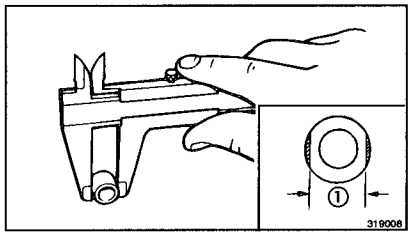
PRIMARY SHEAVE

1. Inspect:
   - Primary sliding sheave ①
   - Primary fixed sheave ②

   Wear/Cracks/Scratch/Damage → Replace.

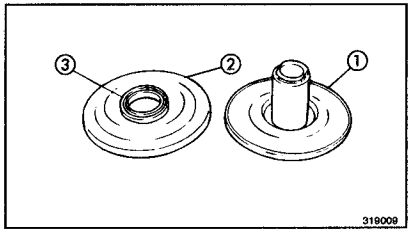


2. Check:
   • Free movement
   Insert the collar ② into the primary sliding sheave ①, and check for free movement.
   Stick or excessive play → Replace the sheave and/or collar.



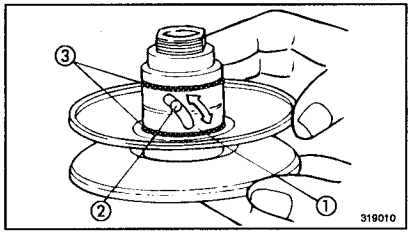
3. Measure:
   • Outside diameter ① (weight)
   Out of specification → Replace.

Outside diameter (weight):
15.0 mm (0.59 in)
<Wear limit>:
14.5 mm (0.57 in)

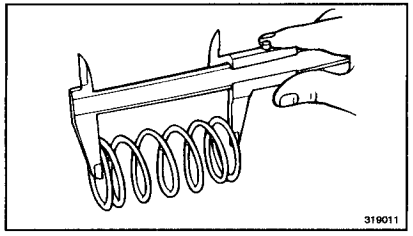


SECONDARY SHEAVE

1. Inspect:
   • Secondary fixed sheave ①
   • Secondary sliding sheave ②
   Scratch/Crack/Damage → Replace as a set.
   • Oil seal ③
   Damage → Replace.

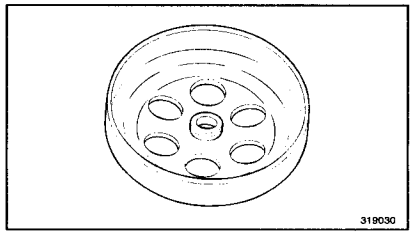


2. Inspect:
   • Torque cam groove ①
   • Guide pin ②
   Wear/Damage → Replace as a set.
   • O-rings ③
   Damage → Replace.



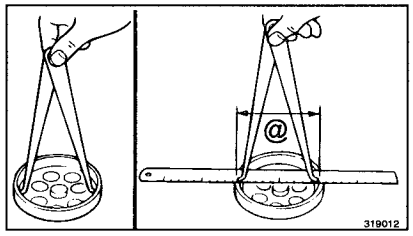
3. Measure:
   • Clutch spring free length
   Out of specification → Replace.

Clutch spring free length:
121.7 mm (4.79 in)
<Wear limit>:
106.7 mm (4.20 in)



4. Inspect:
   • Clutch housing inner surface
   Oil/Scratches → Remove.

Oil	**Use a rag soaked in lacquer thinner or solvent.**
Scratches	**Use an emery cloth (lightly and evenly polishing).**

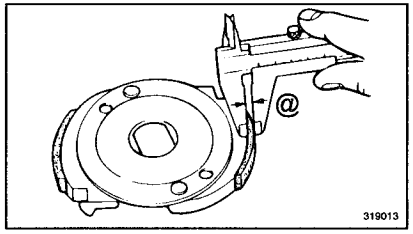


5. Measure:
   • Clutch housing inside diameter @
   Out of specification → Replace.

Clutch housing inside diameter:
105.0 mm (4.13 in)
<Wear Limit>:
105.4 mm (4.15 in)

6. Inspect:
   • Clutch shoes
   Glazed parts → Sand with coarse sandpaper.

NOTE:
After using the sand paper, clean off the polished particles with a cloth.



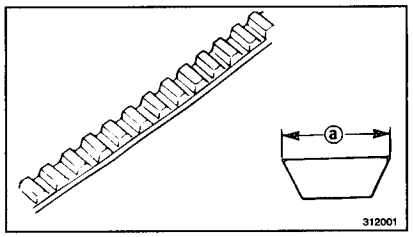
7. Measure:
   • Clutch shoe thickness @
   Out of specification → Replace.

Clutch shoe thickness:
4.0 mm (0.16 in)
<Wear Limit>:
2.5 mm (0.10 in)

V-BELT

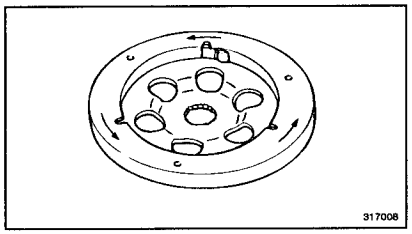
1. Inspect:
   • V-belt
   Crack/Wear → Replace.

NOTE:
Replace the V-belt if it is greasy or oily.



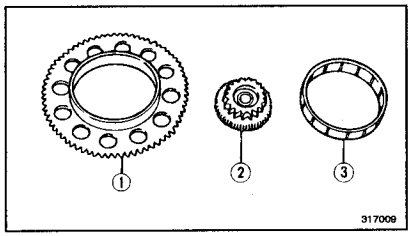
2. Measure:
   • V-belt width @
   Out of specification → Replace.

V-Belt width:
15.0 mm (0.59 in)
<Wear Limit>:
13.5 mm (0.53 in)



STARTER CLUTCH AND GEARS

1. Inspect:
   ◦ Starter clutch
   Push the dowel pin in arrow direction.
   Unsmooth operation → Replace starter clutch assembly.

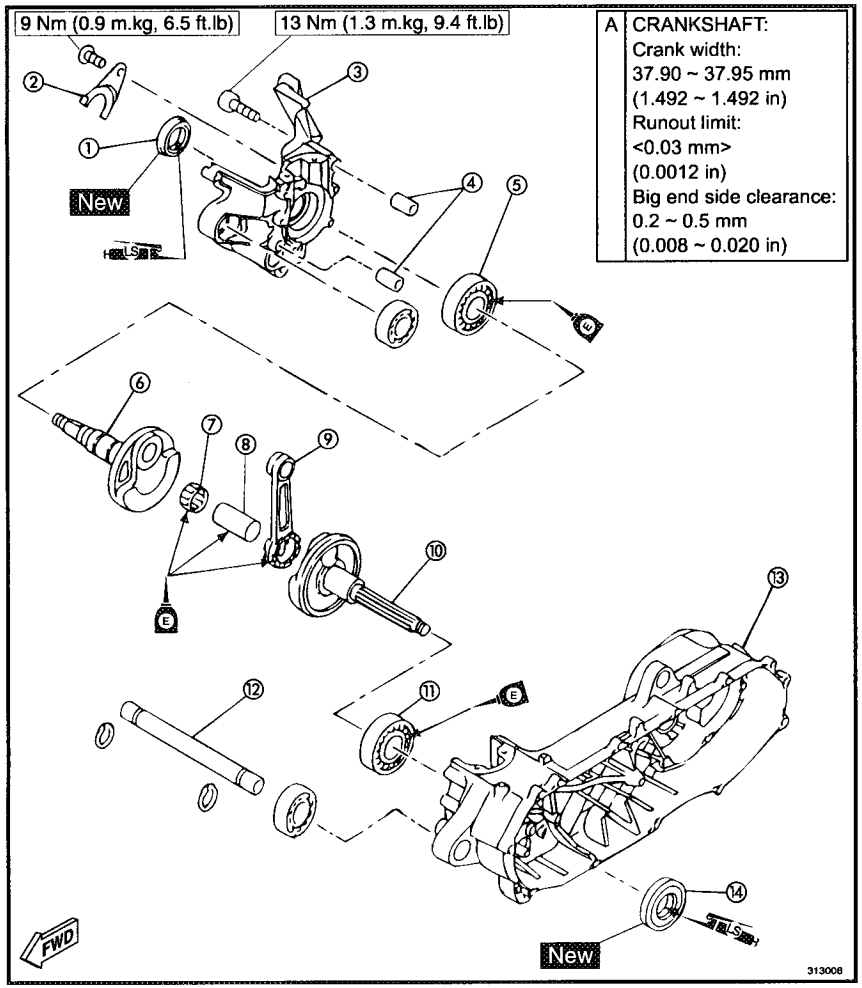


2. Inspect:
   • Starter wheel gear teeth ①
   • Idle gear teeth ②
   Burrs/Chips/Roughness/Wear → Replace.
   • Bearing ③ (starter wheel gear)
   Pitting/Damage → Replace.

ENGINE ASSEMBLY AND ADJUSTMENT

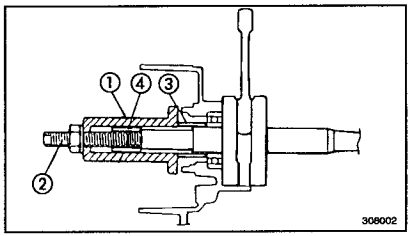
CRANKCASE AND CRANKSHAFT

① Oil seal
② Oil seal holder
③ Crankcase (right)
④ Dowel pin
⑤ Bearing
⑥ Crankshaft (right)
⑦ Bearing
⑧ Crankshaft pin
⑨ Connecting rod
⑩ Crankshaft (left)
⑪ Bearing
⑫ Engine mount shaft
⑬ Crankcase (left)
⑭ Oil seal



CRANKSHAFT AND CRANKCASE

CAUTION:
To protect the crankshaft against scratches and to facilitate the engine assembly and installation, apply grease to oil seal lips, and engine oil to bearings.

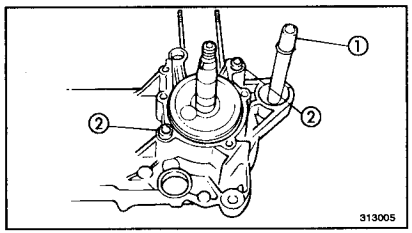


1. Attach:
   • Crankshaft installation tool ①, ②, ③, ④

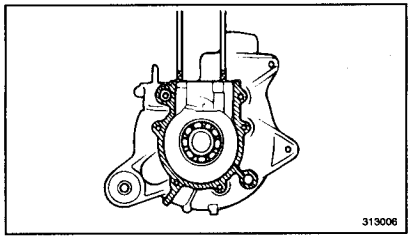
Crankshaft installation tool:
① : 90890-01274
② : 90890-01275
③ : 90890-01277
④ : 90890-01411

2. Install:
   • Crankshaft
   (to left crankcase)

NOTE:
Hold the connecting rod at top dead center with one hand while tightening the nut of the installation tool with the other. Tighten the installation tool until the crankshaft bottoms against the bearing.

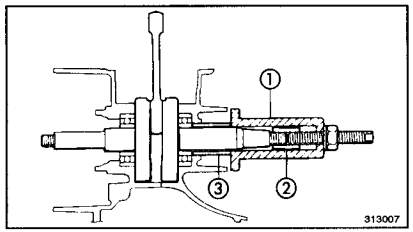


3. Install:
   • Dowel pins ①
   • Spacer ②



4. Apply:
   • HEATPROOF or Yamaha Bond No.1215
   To the mating surfaces of both case halves.

HEATPROOF or Yamaha Bond No.1215

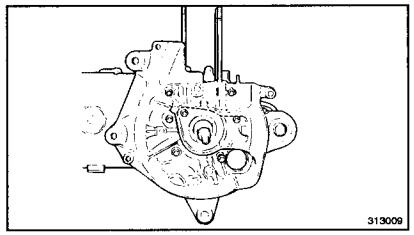


5. Attach:
   • Crankshaft installation tool ①, ②, ③, ④

Crankshaft installation tool :
① : 90890-01274
② : 90890-01275
③ : 90890-01277
④ : 90890-01411

NOTE:
Hold the connecting rod at top dead center with one hand while tightening the nut of the installation tool with the other. Tighten the installation tool until the crankcase halves close with one another.

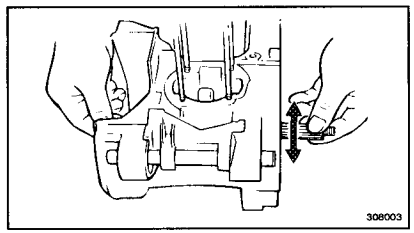
6. Install:
   • Right crankcase



7. Tighten:
   • Crankcase holding screws

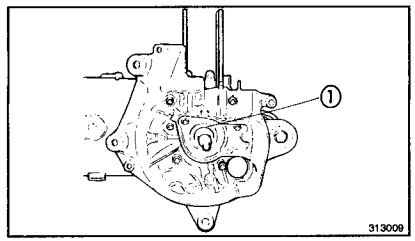
NOTE:
Tighten the crankcase holding screws in stages, using a crisscross pattern.

Crankcase holding screw:
13 Nm (1.3 m.kg, 9.4 ft.lb)



8. Check:
   • Crankshaft operation
   Unsmooth operation → Repair.

CAUTION:
Never hit on the crankshaft.

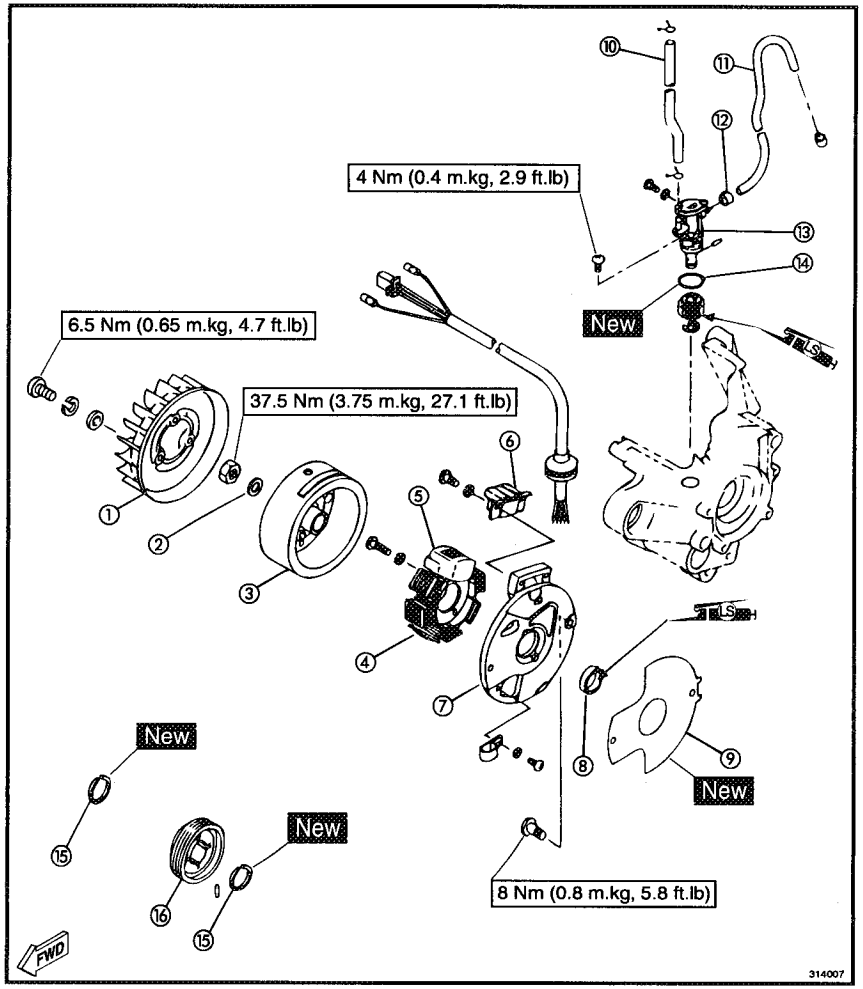


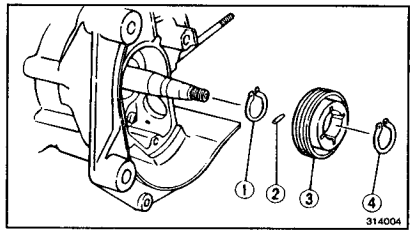
9. Install:
   • Oil seal stopper plate ①

Screw (oil seal stopper plate):
9 Nm (0.9 m.kg, 6.5 ft.lb)

AUTOLUBE PUMP AND CDI MAGNETO

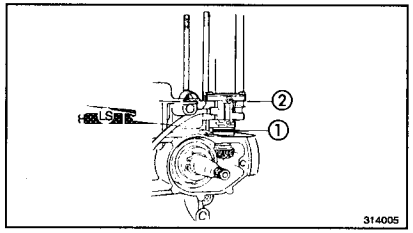
① Fan	⑨ Gasket
② Plain washer	⑩ Oil hose
③ Rotor assembly	⑪ Oil delivery hose
④ Lighting coil	⑫ Clip
⑤ Charge coil	⑬ Autolube pump
⑥ Pick up coil	⑭ O-ring
⑦ Stator assembly	⑮ Circlip
⑧ Oil seal	⑯ Oil pump drive gear





AUTOLUBE PUMP

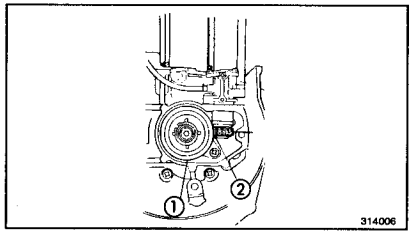
1. Install:
   - Circlip ①
   - Pin ②
   - Pump drive gear ③
   - Circlip ④



2. Apply:
   - Lithium soap base grease (to O-ring ①)

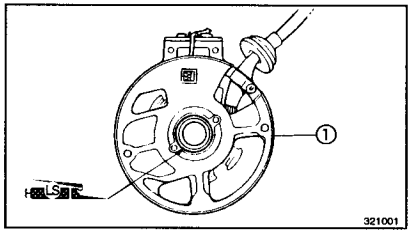
3. Install:
   - Autolube pump ②

Screw (autolube pump): 4 Nm (0.4 m.kg, 2.9 ft.lb)



4. Apply:
   - Lithium soap base grease (to autolube pump gear ①, ②)

Lithium soap base grease: 15 cc (0.92 cu.in)



CDI MAGNETO

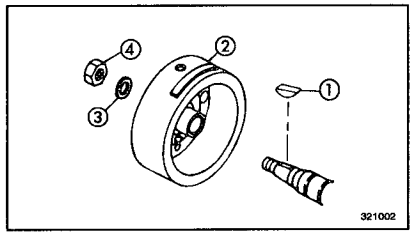
1. Install:
   - Gasket

2. Apply:
   - Lithium soap base grease (to oil seal ①)

3. Pass the CDI magneto lead through the crankcase hole.

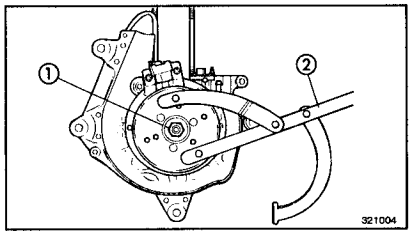
4. Install:
   - Stator assembly

Screw (stator assembly): 8 Nm (0.8 m.kg, 5.8 ft.lb)



5. Install:
   - Woodruff key ①
   - Magneto rotor ②
   - Plain washer ③
   - Nut ④

NOTE:
When installing the magneto rotor, make sure the woodruff key is properly seated in the key way of the crankshaft. Apply a light coating of lithium soap base grease to the tapered portion of the crankshaft end.

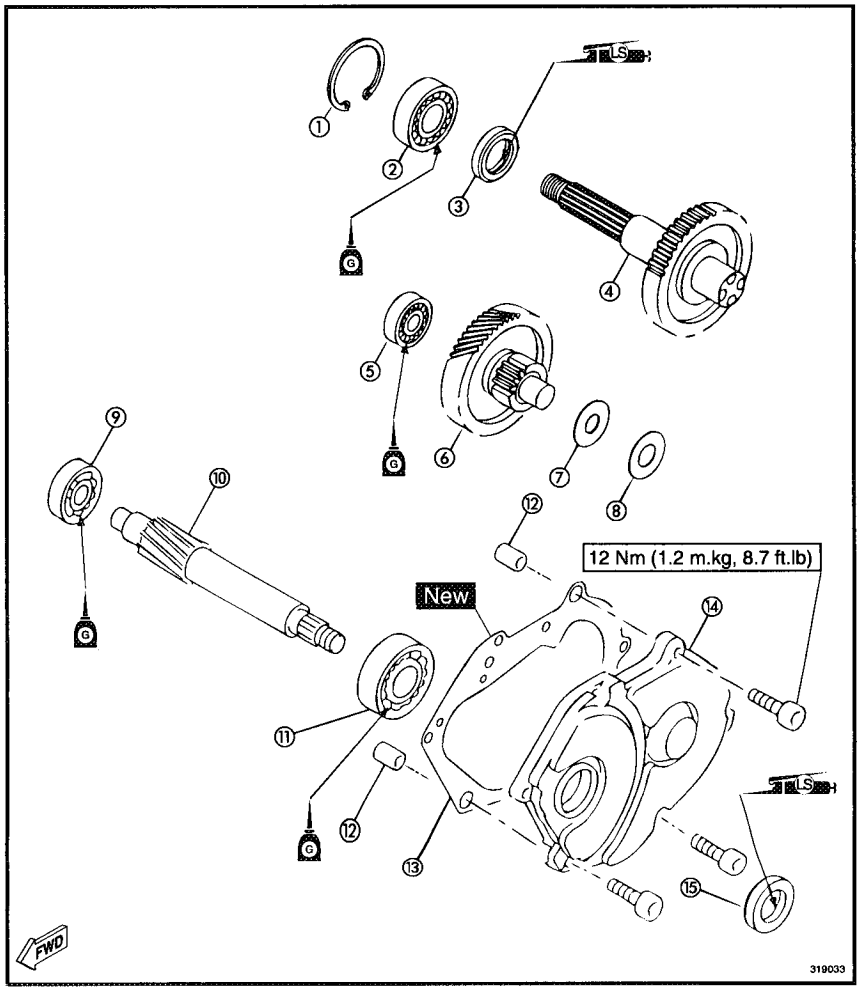


6. Tighten:
   - Nut ① (magneto rotor)
   Use the flywheel holding tool ②.

	Flywheel holding tool: 90890-01235
	Nut (Flywheel magneto): 37.5 Nm (3.75 m.kg, 27.1 ft.lb)

TRANSMISSION

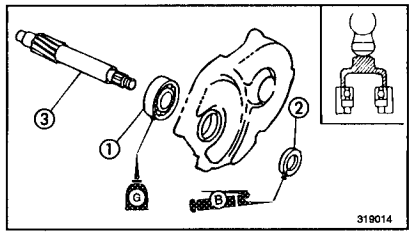
① Circlip
② Bearing
③ Oil seal
④ Drive axle
⑤ Bearing
⑥ Main axle
⑦ Conical spring washer
⑧ Plain washer
⑨ Bearing
⑩ Secondary sheave axle
⑪ Bearing
⑫ Dowel pin
⑬ Gasket
⑭ Transmission case cover
⑮ Oil seal



TRANSMISSION

1. Apply:
   • 10W30 Type SE Motor oil
   (to transmission case cover bearing)

2. Install:
   • Bearing ①

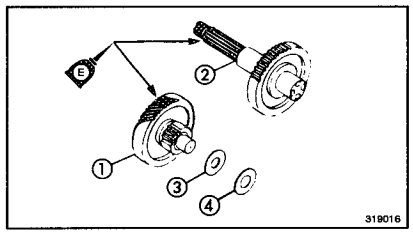


3. Install:
   • Oil seal ②
   • Secondary sheave axle ③

NOTE:
Apply lithium soap base grease onto the oil seal lips.

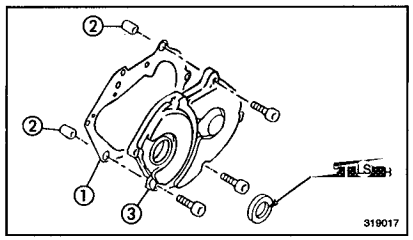
4. Check:
   • Secondary sheave axle operation
   Unsmooth operation → Repair.

5. Apply:
   • 10W30 type SE Motor oil
   (to main axle bearing and drive axle bearing)



6. Install:
   • Drive axle ①
   • Main axle ②
   • Conical spring washer ③
   • Plain washer ④

NOTE:
• Apply lithium soap base grease onto the oil seal lips.
• Always use a new gasket.

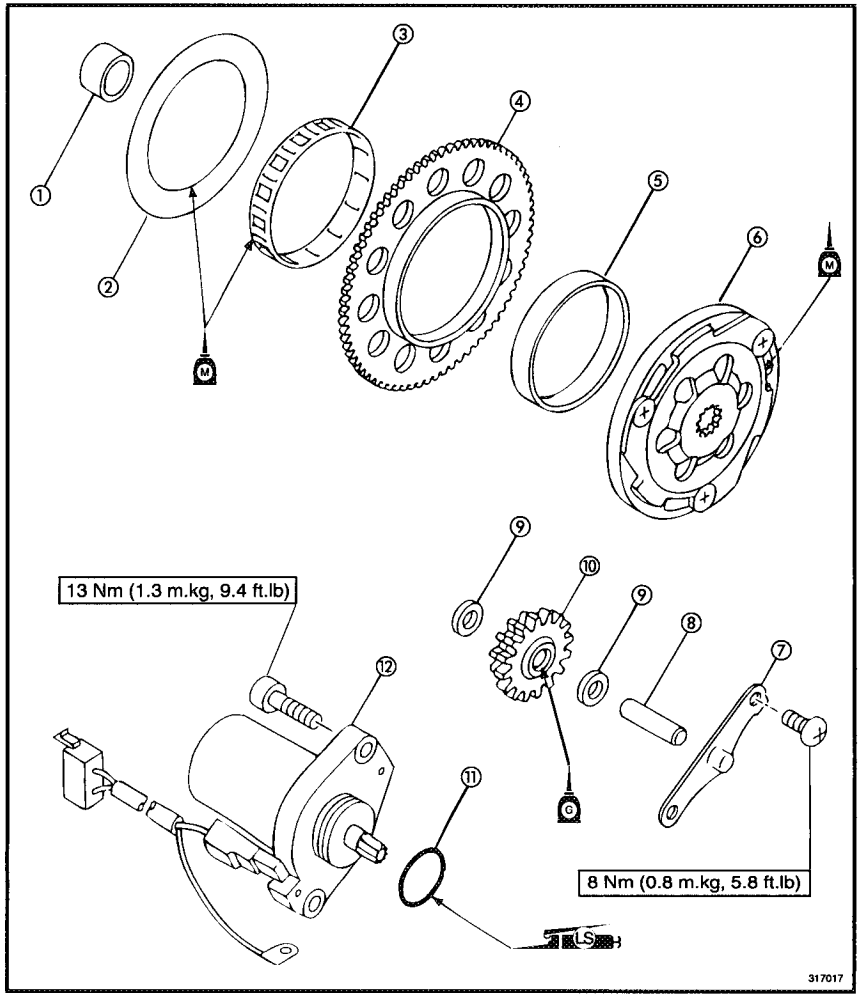


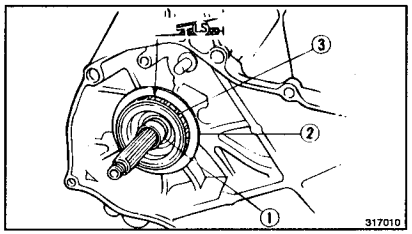
7. Install:
   • Gasket ①
   • Dowel pins ②
   • Transmission case cover ③

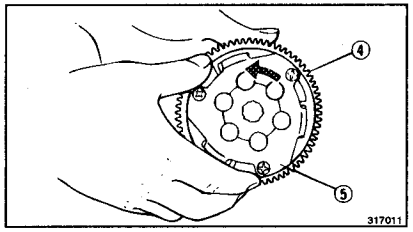
	Screw (case cover): 12 Nm (1.2 m.kg, 8.7 ft.lb)

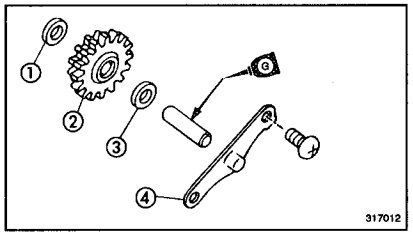
STARTER SYSTEM

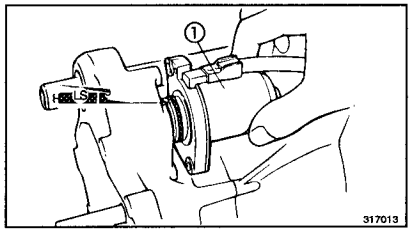
① Collar	⑦ Plate
② Washer	⑧ Shaft
③ Bearing	⑨ Plain washer
④ Starter wheel gear	⑩ Idle gear
⑤ Collar	⑪ O-ring
⑥ Starter clutch	⑫ Starter motor











STARTER SYSTEM

1. Install:
   - Collar ①
   - Washer ②
   - Bearing ③
   - Starter wheel gear ④
   - Starter clutch ⑤

NOTE:
- Apply lithium soap base grease to the bearing.
- Apply molybdenum disulfide oil to the shaft (starter clutch).

2. Install:
   - Plain washer ①
   - Idle gear ②
   - Plain washer ③
   - Plate ④ (idle gear)

	Screw (idle gear plate): 8 Nm (0.8 m.kg, 5.8 ft.lb)

NOTE:
Apply engine oil to the idle gear ②.

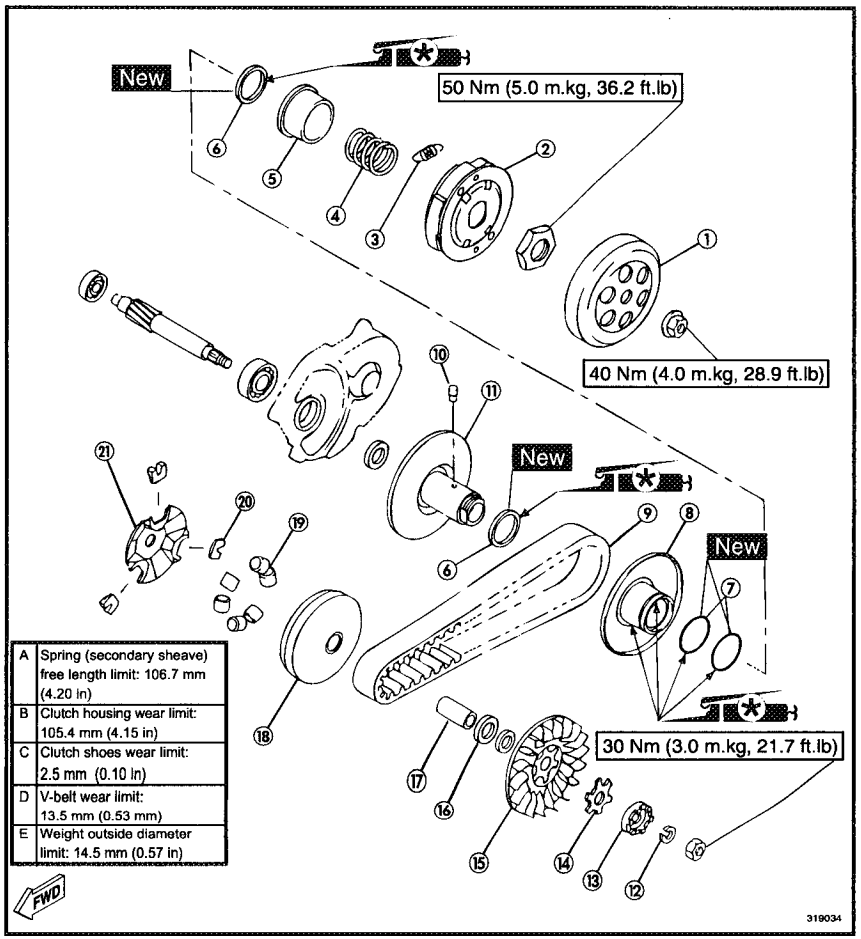
3. Install:
   - Starter motor ①

	Screw (starter motor): 13 Nm (1.3 m.kg, 9.4 ft.lb)

NOTE:
Apply lithium soap base grease to the O-ring of the starter motor.

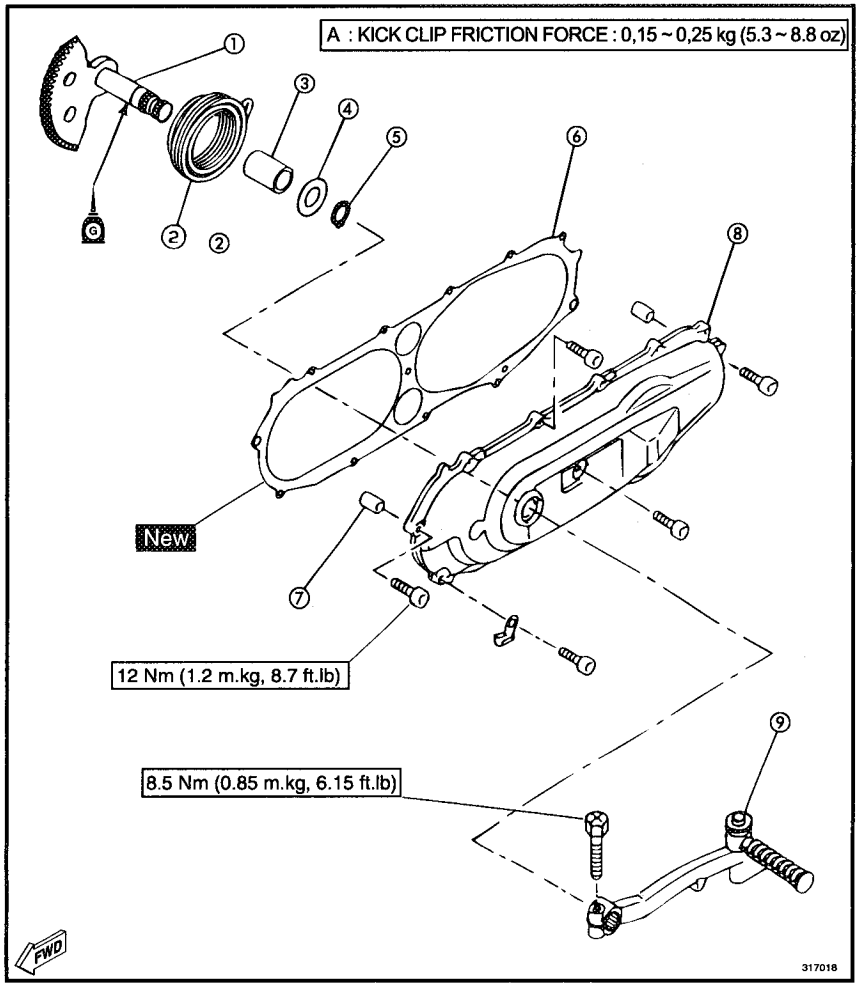
PRIMARY AND SECONDARY SHEAVE

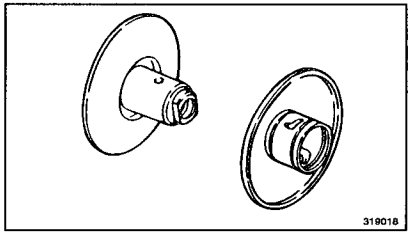
①Clutch housing
②Clutch
③Clutch shoe spring
④Clutch spring
⑤Spring seat
⑥Gasket
⑦Oil seal
⑧Secondary sliding sheave
⑨V-belt
⑩Guide pin
⑪Secondary fixed sheave
⑫Conical spring washer
⑬One-way clutch
⑭Washer
⑮Primary fixed sheave
⑯Plate washer
⑰Spacer
⑱Primary sliding sheave
⑲Clutch weights
⑳Slider
㉑Cam
*Apply BEL-RAY Assembly Lube ®

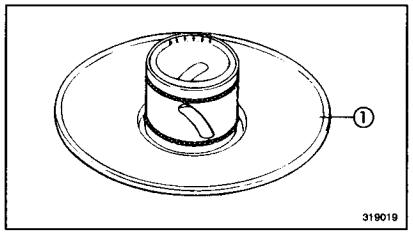


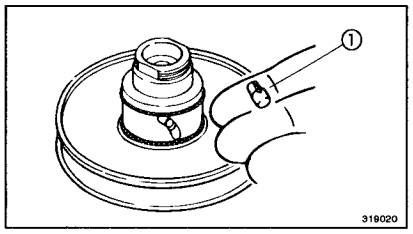
KICK STARTER

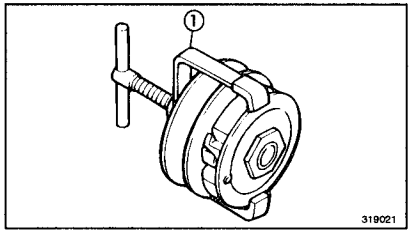
① Kick shaft
② Return spring
③ Collar
④ Plain washer
⑤ Circlip
⑥ Gasket
⑦ Dowel pin
⑧ Transmission case
⑨ Kick crank

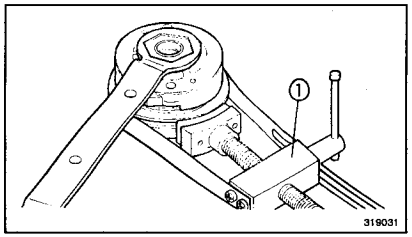












SECONDARY SHEAVE

When assembling the secondary sheave, reverse the disassembly procedure. Note the following points.

1. Apply:
   • BEL-RAY Assembly Lube ®
   (to the sliding parts of the sheave)

2. Install:
   • Sliding sheave ①

NOTE:
Wind adhesive tape around the end of the sheave to avoid turning over the oil seal lips when installing the sheave.

3. Install:
   • Pin ①

4. Apply:
   • BEL-RAY Assembly Lube ®
   (to the torque cam grooves and O-rings)

5. Check:
   • Sliding sheave
   Unsmooth operation → Repair.

CAUTION:
Remove excessive grease.

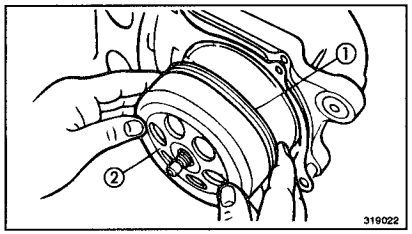
6. Install:
   • Clutch securing nut
   Use the clutch spring holder ①

	Clutch spring holder: 90890-01337

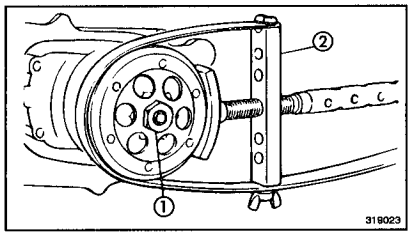
7. Tighten:
   • Clutch securing nut
   Use sheave holder ① (41mm).

	Sheave holder: 90890-01701

	Clutch securing nut: 50 Nm (5.0 m.kg, 36.2 ft.lb)



8. Install:
   - Dowel pin
   - Gasket
   - Secondary sheave assembly ①
   - Clutch housing ①

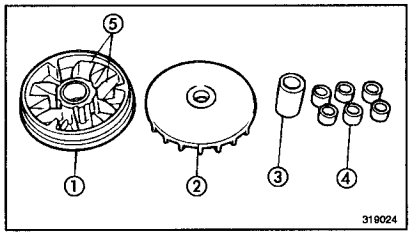


9. Tighten:
   - Nut ① (secondary sheave)

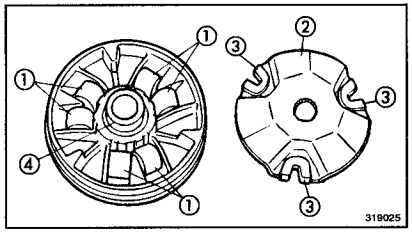
   Use sheave holder ②

	Sheave holder: P/N. 90890-01701
	Nut (secondary sheave): 40 Nm (4.0 m.kg, 28.9 ft.lb)

PRIMARY SHEAVE



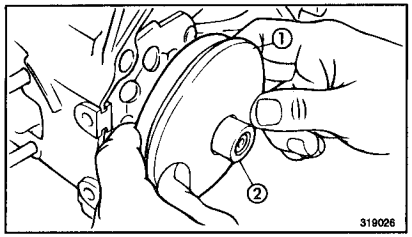
1. Clean:
   - Primary sliding sheave face ①
   - Primary fixed sheave face ②
   - Collar ③
   - Weight ④
   - Primary sliding sheave cam surface ⑤



2. Install:
   - Weight ①
   - Cam ②
   - Slider ③
   - Collar ④

3. Check:
   - Cam operation

   Unsmooth operation → Repair.

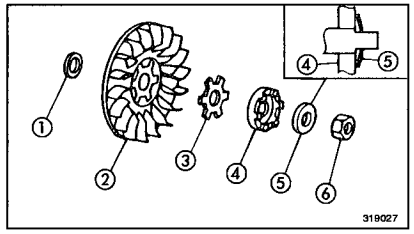


4. Install:
   - Primary sheave assembly ①
   - Collar ②

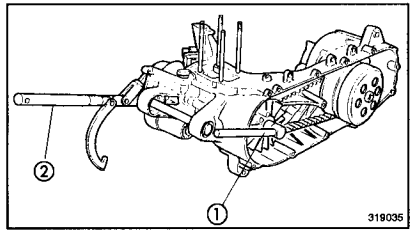
5. Install:
   - V-belt

Place the V-belt around the secondary sheave, and compress the secondary sheave spring hard so that the V-belt moves toward the clutch hub.

NOTE:
- The arrow on the V-belt must point to the front.
- Make sure the V-belt is not stained with oil or grease.



6. Install:
   - Shim ①
   - Primary fixed sheave ②
   - Washer ③
   - One-way clutch ④
   - Washer ⑤
   - Nut ⑥



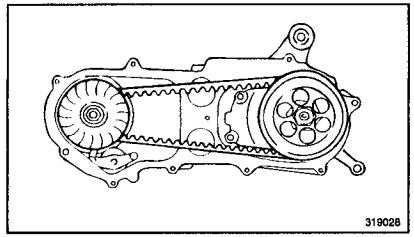
7. Tighten:
   - Nut ① (primary sheave)

	Nut (primary sheave): 30 Nm (3.0 m.kg, 21.7 ft.lb)

NOTE:

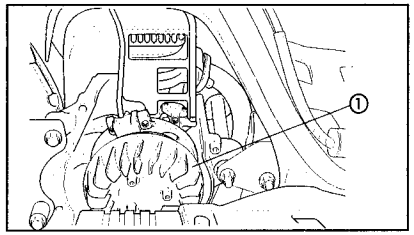
When tightening the nut (primary sheave), hold the magneto rotor using the flywheel holding tool ②.

	Flywheel holding tool: 90890-01235



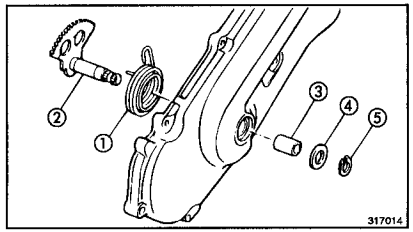
8. Adjust:
   - V-belt

   Tense the V-belt by turning the primary sheave several times.



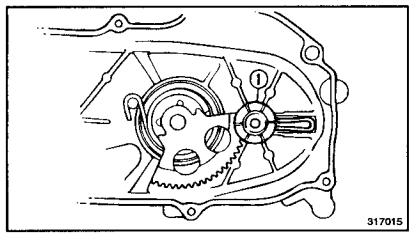
9. Install:
   • Fan ①

	Screw (fan): 6.5 Nm (0.65 m.kg, 4.7 ft.lb)



KICK STARTER

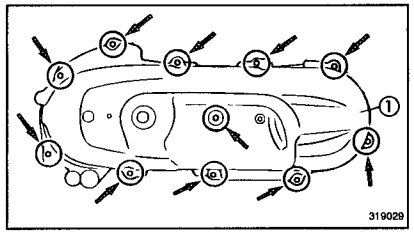
1. Install:
   • Return spring ①
   • Kick shaft ②
   • Collar ③
   • Washer ④
   • Circlip ⑤



2. Hook:
   • Return spring
   (to the kick gear and boss)

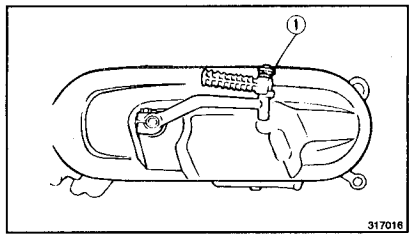
3. Install:
   • Kick pinion gear ①

NOTE:
Install the spring as shown.



4. Install:
   • Transmission case ①

	Screw (transmission case): 12 Nm (1.2 m.kg, 8.7 ft.lb)

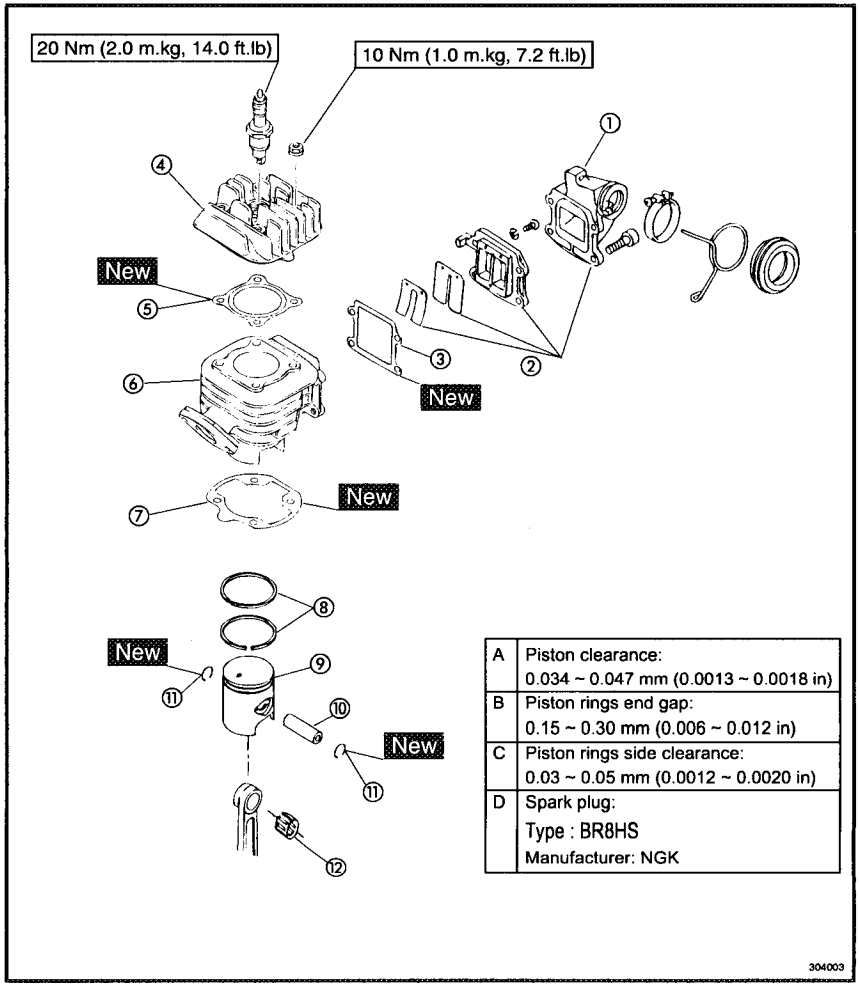


5. Install:
   • Kick crank ①

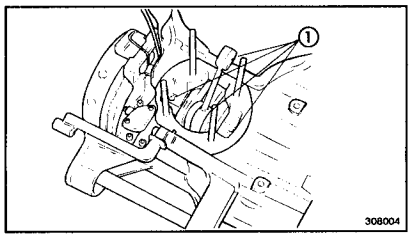
	Bolt (kick crank): 8.5 Nm (0.85 m.kg, 6.15 ft.lb)

PISTON, CYLINDER AND CYLINDER HEAD

① Carburetor joint	⑦ Cylinder gasket
② Reed valve	⑧ Piston ring
③ Gasket	⑨ Piston
④ Cylinder head	⑩ Piston pin
⑤ Cylinder head gasket	⑪ Piston pin clip
⑥ Cylinder	⑫ Bearing

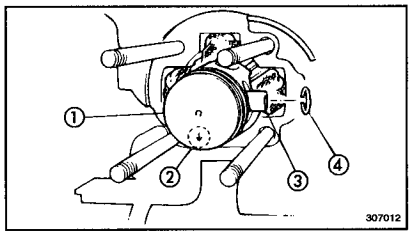


A	Piston clearance: 0.034 ~ 0.047 mm (0.0013 ~ 0.0018 in)
B	Piston rings end gap: 0.15 ~ 0.30 mm (0.006 ~ 0.012 in)
C	Piston rings side clearance: 0.03 ~ 0.05 mm (0.0012 ~ 0.0020 in)
D	Spark plug: Type : BR8HS Manufacturer: NGK



PISTON PIN AND PISTON

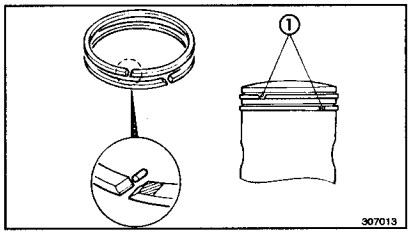
1. Apply:
   - Engine oil ①
   (to crankshaft bearing, connecting rod big end bearing, small end bearing, piston pin, piston ring grooves and piston skirt.)



2. Install:
   - Small end bearing
   - Piston ①
   - Piston pin ③
   - Piston pin clip ④

NOTE:
- The arrow ② on the piston must point to the exhaust side.
- Before installing the piston pin clip, cover the crankcase with a clean towel or rag so you will not accidentally drop the pin clip and material into the crankcase.

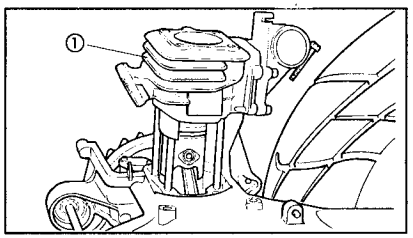
CAUTION:
- **The ends of the piston pin clip must not come together at the slot in the piston groove.**
- **Always use a new piston pin clip.**



CYLINDER AND CYLINDER HEAD

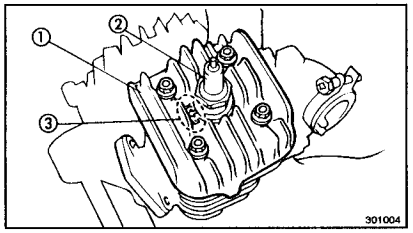
1. Install:
   - Cylinder gasket (new gasket)
2. Check:
   - Piston rings

NOTE:
- Make sure the ring ends ① are properly fitted around the ring locating pins in the piston grooves.
- Be sure to check the manufacturer's marks or numbers stamped on the rings are on the top side of the rings.



3. Install:
   - Cylinder ①

NOTE:
Install the cylinder with one hand, while compressing the piston rings with the other hand.

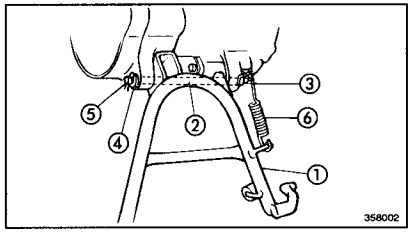


4. Install:
   - Cylinder head gasket (new gasket)

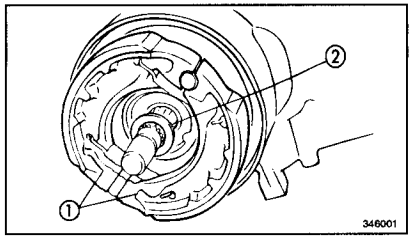
5. Install:
   - Cylinder head ①
   - Spark plug ②

NOTE:
- Tighten the cylinder head holding nuts in stages, and crisscross sequence.
- The arrow ③ on the cylinder head must point to the front.

Nut (cylinder head):
10 Nm (1.0 m.kg, 7.2 ft.lb)
Spark plug:
20 Nm (2.0 m.kg, 14.0 ft.lb)



6. Install:
   - Center stand ①
   - Shaft ②
   - Clamp ③
   - Rubber washer ④
   - Clip ⑤
   - Spring ⑥



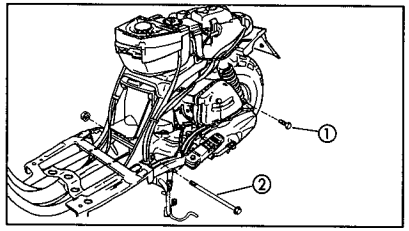
7. Install:
   - Brake shoes ①
   - Plain washer ②
   - Rear wheel
   - Plate washer
   - Nut

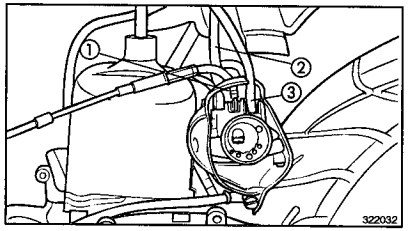
8. Install:
   • Air shroud
   • Oil hose
   • Oil delivery hose

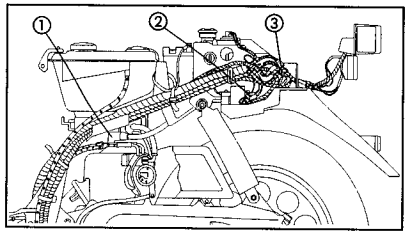
NOTE:
Pass the oil delivery hose and oil hose as shown.

9. Air bleeding:
   • Autolube pump

Refer to "AUTOLUBE PUMP AIR BLEEDING" in CHAPTER 3.







ENGINE REMOUNTING

Reverse the removal procedure.
Note the following points.

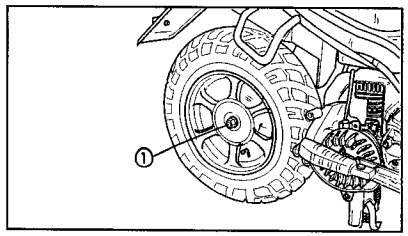
1. Install:
   • Engine mounting bolt ①
   • Rear shock absorber bolt ② (lower)
   These bolts should be temporarily secured.
2. Tighten:
   • Engine mounting bolt
   • Rear shock absorber bolt (lower)

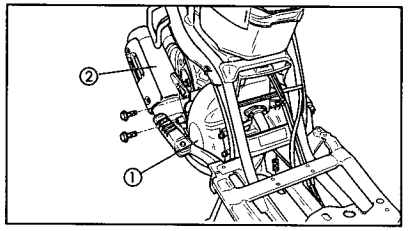
	Engine mounting bolt: 42 Nm (4.2 m.kg, 30.4 ft.lb) **Rear shock absorber bolt (lower): 17.5 Nm (1.75 m.kg, 12.6 ft.lb)**

3. Install:
   • Carburetor top together with throttle valve ①
   • Fuel hose ②/Vacuum hose ③
   • Rear brake cable

NOTE:
When installing the throttle valve into the carburetor, align the groove of the throttle valve with the projection of the carburetor.

4. Connect:
   • Spark plug cap ①
   • Starter motor ②
   • CDI magneto lead ③
   • Earth (ground lead)





5. Tighten:
   • Rear wheel axle nut ①

NOTE:
When tightening the rear wheel axle nut, apply the rear brake.

	Rear wheel axle nut: 103.5 Nm (10.35 m.kg, 74.8 ft.lb)

6. Install:
   • ProtectorMuffler assembly
   • Muffler assembly ①
   • Air shroud ②.

	Bolt (muffler): 29 Nm (2.9 m.kg, 21.0 ft.lb) **Bolt (exhaust pipe): 8.5 Nm (0.85 m.kg, 6.15 ft.lb)**

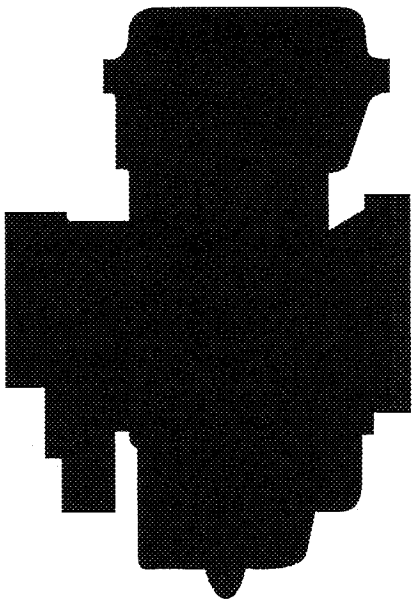
7. Fill:
   • Transmission oil

Refer to "TRANSMISSION OIL REPLACEMENT" in CHAPTER 3.

8. Adjust:
   • Brake lever free play

Refer to "FRONT/REAR BRAKE LEVER FREE PLAY ADJUSTMENT" in CHAPTER 3.
   • Engine idle speed
   • Throttle cable free play

Refer to "THROTTLE CABLE FREE PLAY ADJUSTMENT" and "ENGINE IDLE SPEED ADJUSTMENT" in CHAPTER 3.



CARB 5

CARB

CHAPTER 5.
CARBURETION

CARBURETOR D-12
REMOVAL D-12
DISASSEMBLY D-12
INSPECTION D-13
ASSEMBLY D-14
INSTALLATION D-14

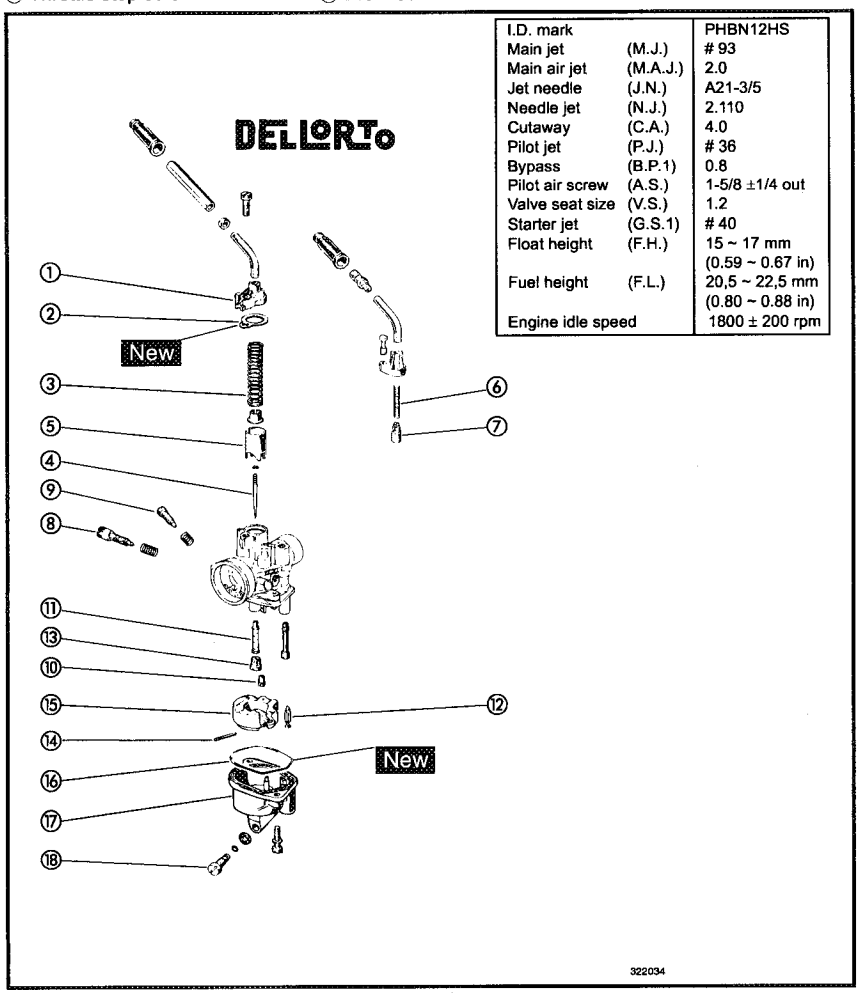
FUEL COCK D-15
INSPECTION D-15

REED VALVE D-15
REMOVAL D-15
INSPECTION D-15
INSTALLATION D-16

CARBURETOR

① Carburetor top
② Gasket
③ Throttle valve spring
④ Needle set
⑤ Throttle valve
⑥ Starter plunger spring
⑦ Starter plunger
⑧ Air screw
⑨ Throttle stop screw
⑩ Pilot jet
⑪ Needle jet
⑫ Needle valve
⑬ Main jet
⑭ Float pin
⑮ Float
⑯ Float chamber gasket
⑰ Float chamber
⑱ Drain screw

I.D. mark		PHBN12HS
Main jet	(M.J.)	# 93
Main air jet	(M.A.J.)	2.0
Jet needle	(J.N.)	A21-3/5
Needle jet	(N.J.)	2.110
Cutaway	(C.A.)	4.0
Pilot jet	(P.J.)	# 36
Bypass	(B.P.1)	0.8
Pilot air screw	(A.S.)	1-5/8 ±1/4 out
Valve seat size	(V.S.)	1.2
Starter jet	(G.S.1)	# 40
Float height	(F.H.)	15 ~ 17 mm (0.59 ~ 0.67 in)
Fuel height	(F.L.)	20,5 ~ 22,5 mm (0.80 ~ 0.88 in)
Engine idle speed		1800 ± 200 rpm

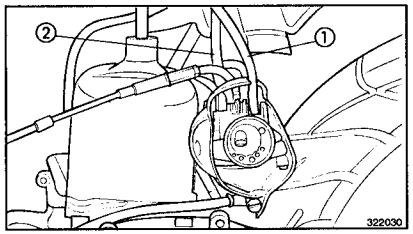


REMOVAL

1. Remove:
   • Covers and footrest board

Refer to " COVERS" in CHAPTER 3.

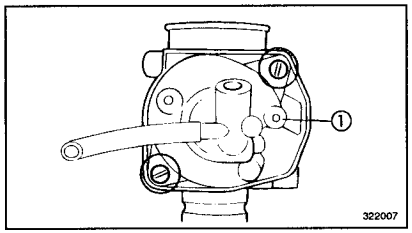
   • Air filter case assembly

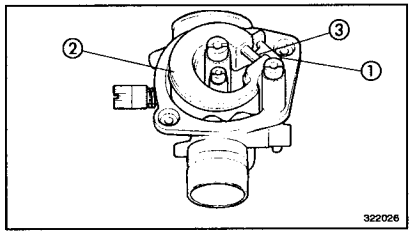


2. Disconnect:
   • Fuel hose ①
   • Oil hose ②
3. Remove:
   • Carburetor top
   • Throttle valve
   • Starter plunger top
   • Starter plunger
   • Carburetor

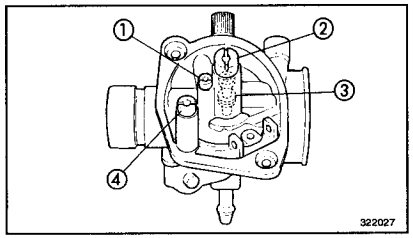
DISASSEMBLY

1. Remove:
   • Float chamber ①

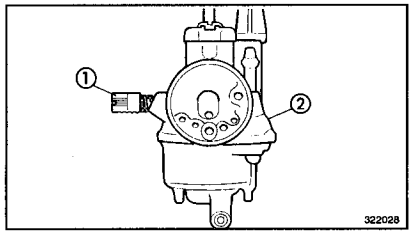




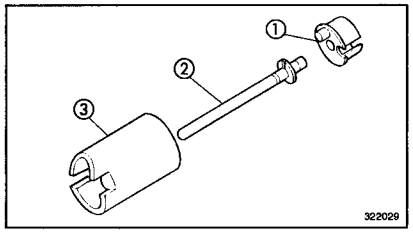
2. Remove:
   • Float pin ①
   • Float ②
   • Needle valve ③



3. Remove:
   • Pilot jet ①
   • Main jet ②
   • Main nozzle ③
   • Starter jet ④



4. Remove:
   • Throttle stop screw ①
   • Spring (throttle stop screw)
   • Air screw ②
   • Spring (air screw)

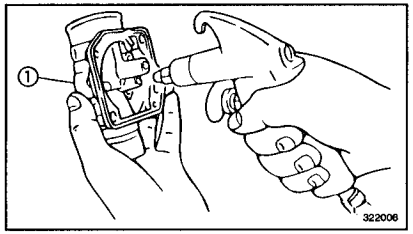


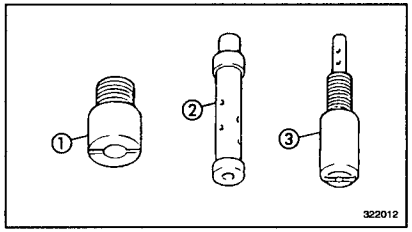
5. Remove
   • Needle clip ①
   • Jet needle ②
   • Throttle valve ③

INSPECTION

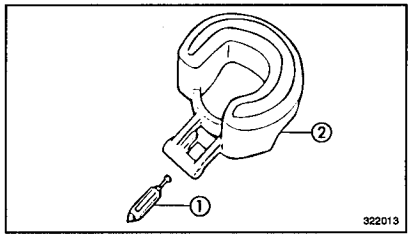
1. Check:
   • Carburetor body ①
   Dirt → Clean.

NOTE:
Use a petroleum based solvent for cleaning. Blow out all passages and jets with compressed air.

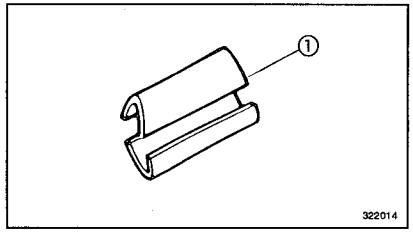




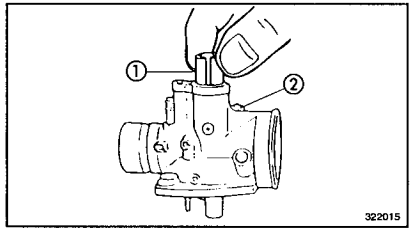
2. Inspect:
   • Main jet ①
   • Main nozzle ②
   • Pilot jet ③
   • Starter jet
   Contamination → Clean.



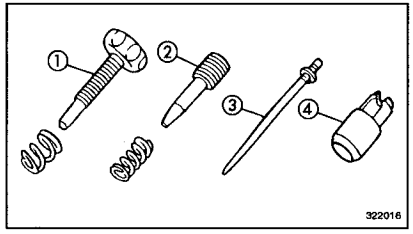
3. Check:
   • Needle valve ①
   Wear/Contamination → Replace.
   • Float ②
   Damage → Replace.
   • Gasket
   Damage → Replace.



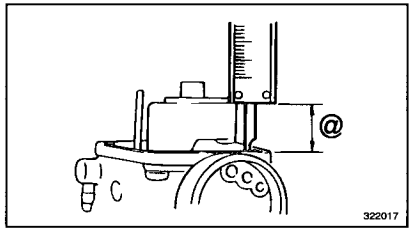
4. Check:
   • Throttle valve ①
   Wear/Damage → Replace.



5. Check:
   • Throttle valve free movement
   Unsmooth/stickiness → Replace.
   Insert the throttle valve ① into the carburetor body ② and check for smooth movement.



6. Check:
   • Throttle stop screw ①
   • Air screw ②
   • Needle ③
   • Starter plunger ④
   Wear/Damage → Replace.



7. Measure:
   • Float height @
   Out of specification → Inspect needle valve, float, and valve seat.

Float height @:
15.0 ~ 17.0 mm (0.59 ~ 0.67 in)

****

Float height measurement steps:

- Install the needle valve, float and float pin into the carburetor body.
- Hold the carburetor upside down.
- Measure the height distance between the mating surface of the float chamber (gasket removed) and the top of the float, using a gauge.

NOTE:
The float arm should be resting on the needle valve. It should not compress the needle valve.

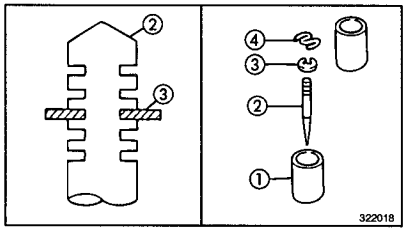
- If the float height is not within specification, inspect the needle valve, float and valve seat.
- If one of these parts is worn, replace the whole set.
- If both parts are in good condition, replace the float.
- Check the float height again.

****

NOTE:
The float height is factory-adjusted. Never try to adjust it yourself.

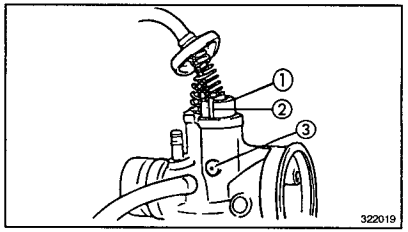
ASSEMBLY
Reverse the "DISASSEMBLY" procedures. Note the following points.

CAUTION:
• Before reassembling the carburetor wash all its components in clean gasoline.
• Always use new gaskets.



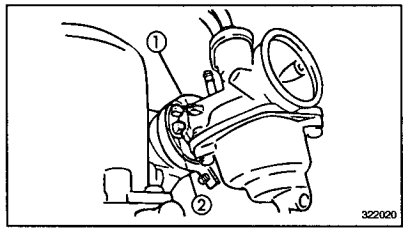
1. Install:
   • Needle ②
   • Clip ③
   • Throttle valve ①
   • Spring seat ④
   • Spring

Jet needle clip position: 3/5



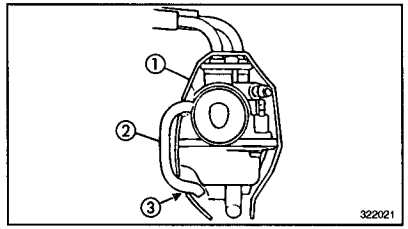
2. Install:
   • Throttle valve ①
   • Starter plunger

NOTE:
Align the groove ② of the throttle valve with the projection ③ of the carburetor body.



3. Install:
   • Carburetor

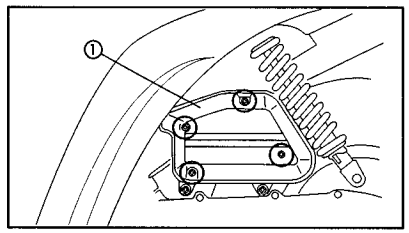
NOTE:
Align projection ① with projection ②.



INSTALLATION
To install the carburetor reverse the "REMOVAL" procedures. Note the following points.

1. Install:
   • Carburetor cover ①
   • Air hose ②
   Pass the air hose through the hole ③ in the carburetor cover.

2. Adjust:
   • Throttle cable free play
Refer to "THROTTLE CABLE FREE PLAY ADJUSTMENT" in CHAPTER 3.



3. Install:
   • Air filter case assembly

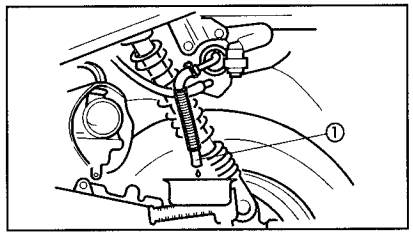
FUEL COCK

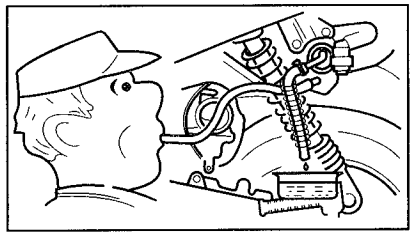
INSPECTION

1. Stop the engine.

2. Remove:
   • Mole

Refer to "COVERS" in CHAPTER 3.





3. Check:
   • Fuel cock

****

Fuel cock inspection steps:

- Disconnect the fuel hose ①.
- Place a receptacle under the fuel hose end.
- If fuel stops flowing within a few seconds, the fuel cock is in good condition. If not clean or replace the fuel cock.
- Disconnect the vacuum hose and breathe in through the hose to create a vacuum in the fuel cock.
- If fuel flows out of the fuel hose when vacuum is applied and stops flowing when vacuum stops, the fuel cock is in good condition.
- If not, clean or replace the vacuum hose, the fuel hose and the fuel cock.

****

REED VALVE

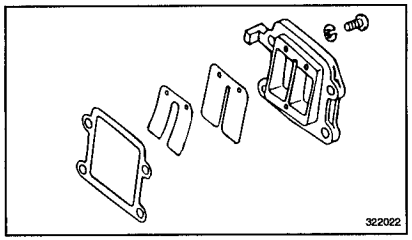
REMOVAL

1. Remove:
   • Side covers

Refer to "COVERS" in CHAPTER 3.

2. Remove:
   • Carburetor

Refer to section "CARBURETOR REMOVAL".



3. Remove:
   • Carburetor joint
   • Reed valve assembly

INSPECTION

1. Check:
   • Carburetor joint
   Damage/Cracks → Replace.
   • Reed valve
   Wear/Cracks/Damage → Replace.

****

Reed valve inspection steps:

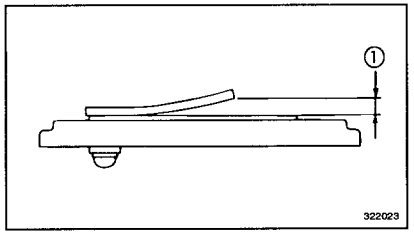
- Visually inspect the reed valve.

NOTE:

A reed valve in good condition should be completely or at least nearly flush with the valve seat.

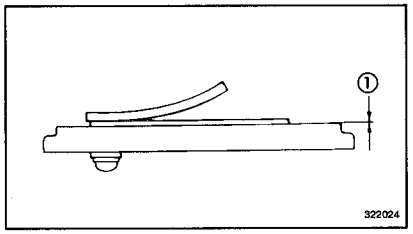
- If in doubt, apply suction to the carburetor side of the assembly.
- Leakage should be minimal to moderate.

****



2. Measure:
   • Valve stopper height ①
   Out of specification → Replace valve stopper.

Valve stopper height:
4.0 ~ 4.4 mm (0.157 ~ 0.173 in)



3. Measure:
   • Reed valve clearance ①
   Out of specification → Replace reed valve.

Reed valve clearance:
Less than 0.2 mm (0.008 in)

INSTALLATION

To install the reed valve reverse the "REMOVAL" procedure. Note the following points.

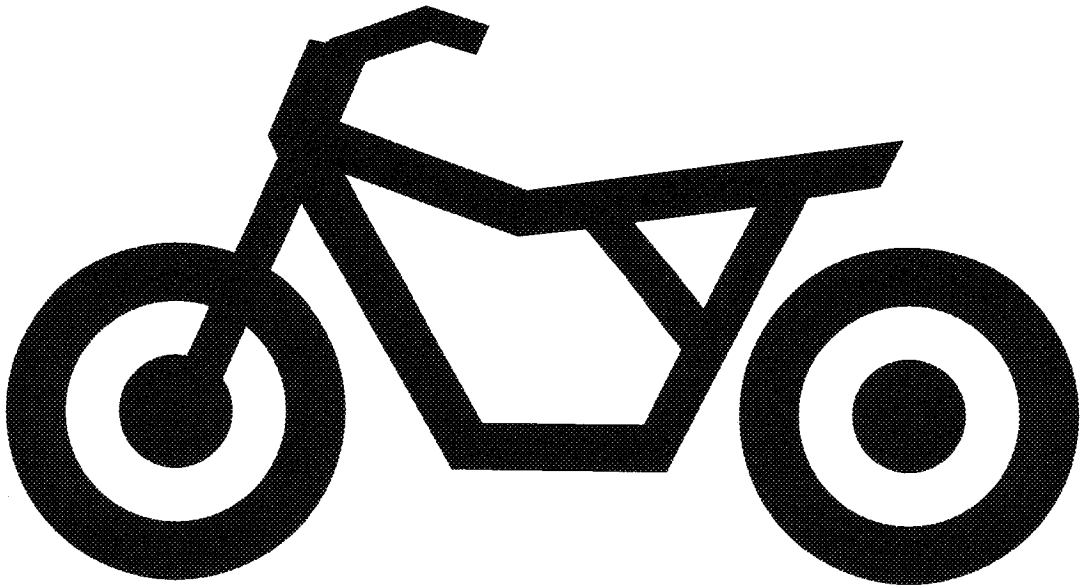
1. Install:
   - Gasket (new)

2. Tighten:
   - Reed valve assembly bolts

	Reed valve assembly bolts: 8.5 Nm (0.85 m.kg, 6.15 ft.lb)

NOTE:

Tighten the screws crosswise in several steps to prevent warpage of the read valve assembly and the carburetor joint.



CHAS 6

CHAS

CHAPTER 6.
CHASSIS

FRONT WHEEL E-4
REMOVAL E-4
INSPECTION E-4
INSTALLATION E-5

FRONT BRAKE E-5
BRAKE PADS REPLACEMENT E-6
CALIPER DISASSEMBLY E-7
MASTER CYLINDER DISASSEMBLY E-7
INSPECTION AND REPAIR E-8
CALIPER ASSEMBLY E-8
MASTER CYLINDER ASSEMBLY E-9

REAR WHEEL E-10
REMOVAL E-10
INSPECTION E-10
ASSEMBLY E-11
INSTALLATION E-11

FRONT FORK E-12
REMOVAL E-13
DISASSEMBLY E-13
INSPECTION E-14
ASSEMBLY E-14
INSTALLATION E-14

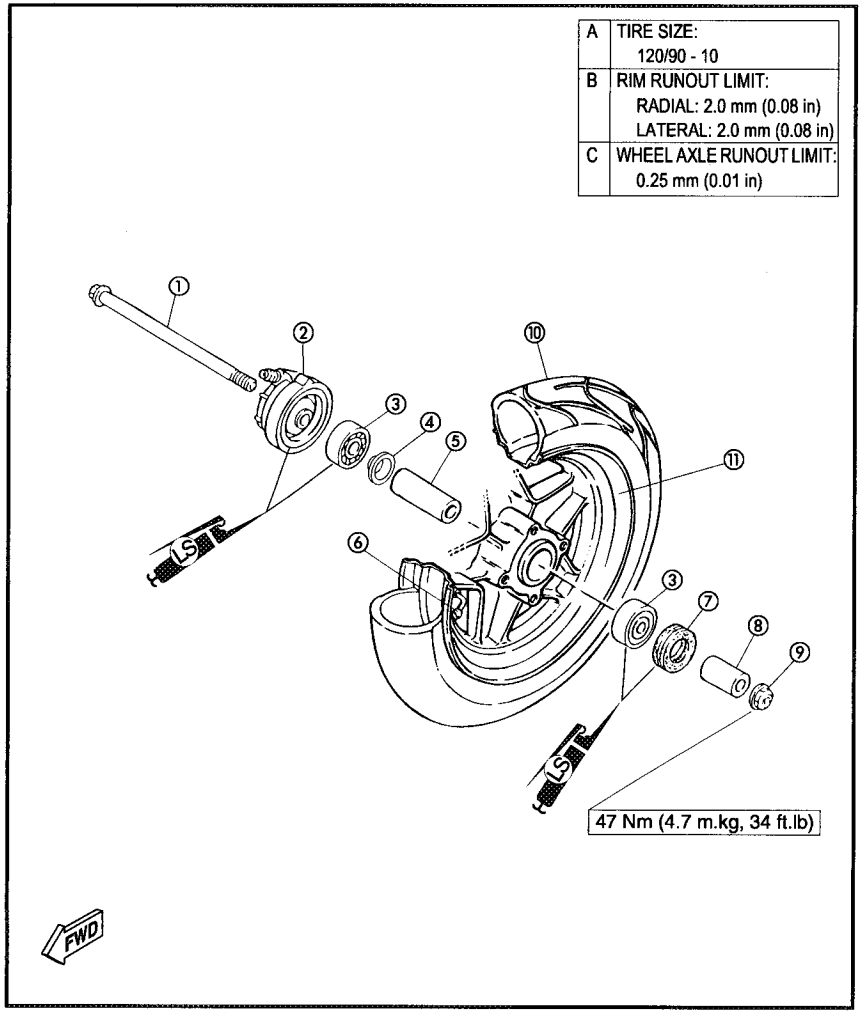
STEERING HEAD AND HANDLEBAR E-15
REMOVAL E-15
INSPECTION E-16
ASSEMBLY AND INSTALLATION E-16

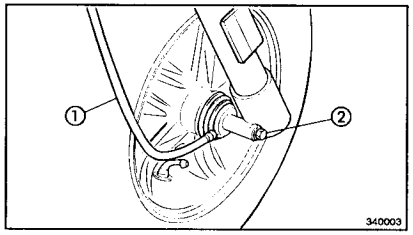
REAR SHOCK ABSORBER F-2
REMOVAL F-2
INSPECTION F-2
INSTALLATION F-2

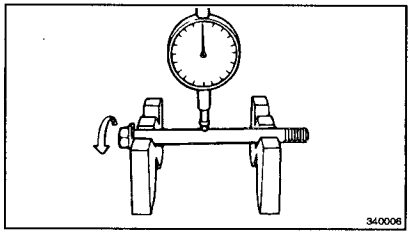
CHASSIS

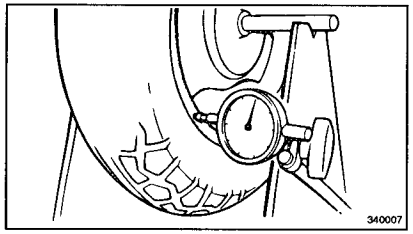
FRONT WHEEL

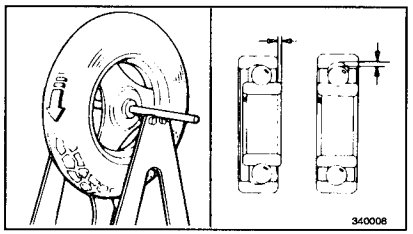
① Axle
② Speedometer gear
③ Bearing
④ Flange
⑤ Collar
⑥ Valve
⑦ Oil seal
⑧ Collar
⑨ Axle nut
⑩ Front wheel
⑪ Tire

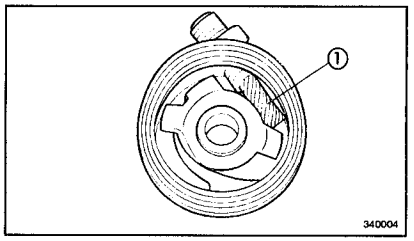












REMOVAL

1. Remove:
   - Front caliper fixing bolts
   - Front caliper
   - Speedometer cable ①
   - Axle ②
   - Front wheel

NOTE:
Never depress the brake lever when the wheel is off the scooter. Otherwise the brake pads will be forced shut.

INSPECTION

1. Inspect:
   - Front axle runout
   Out of specification → Replace.

Axle runout limit:
0.25 mm (0.01 in)

⚠ WARNING
Do not attempt to straighten a bent axle.

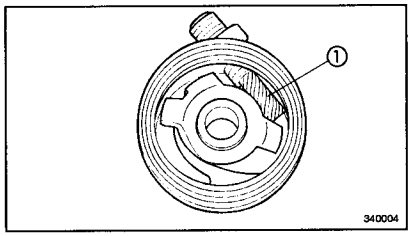
2. Measure:
   - Wheel runout
   Out of specification → Replace.

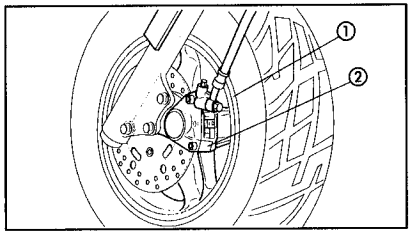
Rim runout limit:
Radial: 2.0 mm (0.08 in)
Lateral: 2.0 mm (0.08 in)

3. Inspect:
   - Tire
   Wear/Cracks/Warpage → Replace.

4. Inspect:
   - Wheel bearings
   Bearings allow play in the wheel hub or wheel turns roughly → Replace.

5. Check:
   - Speedometer gear ①
   Wear/Damage → Replace.





INSTALLATION

Reverse the "Removal" procedure.

Note the following points.

1. Lubricate:
   - Front wheel axle
   - Bearings
   - Oil seal (lips)
   - Drive/driven gear (speedometer)

Recommended lubricant:
Lithium soap base grease

2. Install:
   - Speedometer gear unit ①

NOTE:

Be sure that the two projections at the gear unit mesh with the two slots on the wheel hub.

3. Install:
   - Front wheel ①
   - Front caliper ②

NOTE:

Be sure that the slot (torque stopper) of the gear unit housing is positioned correctly.

4. Tighten:
   - Front wheel axle
   - Front caliper mounting bolts

Front wheel axle:
47 Nm (4.7 m.kg, 34 ft.lb)
Front caliper mounting bolts:
23 Nm (2.3 m.kg, 16.6 ft.lb)

⚠ WARNING

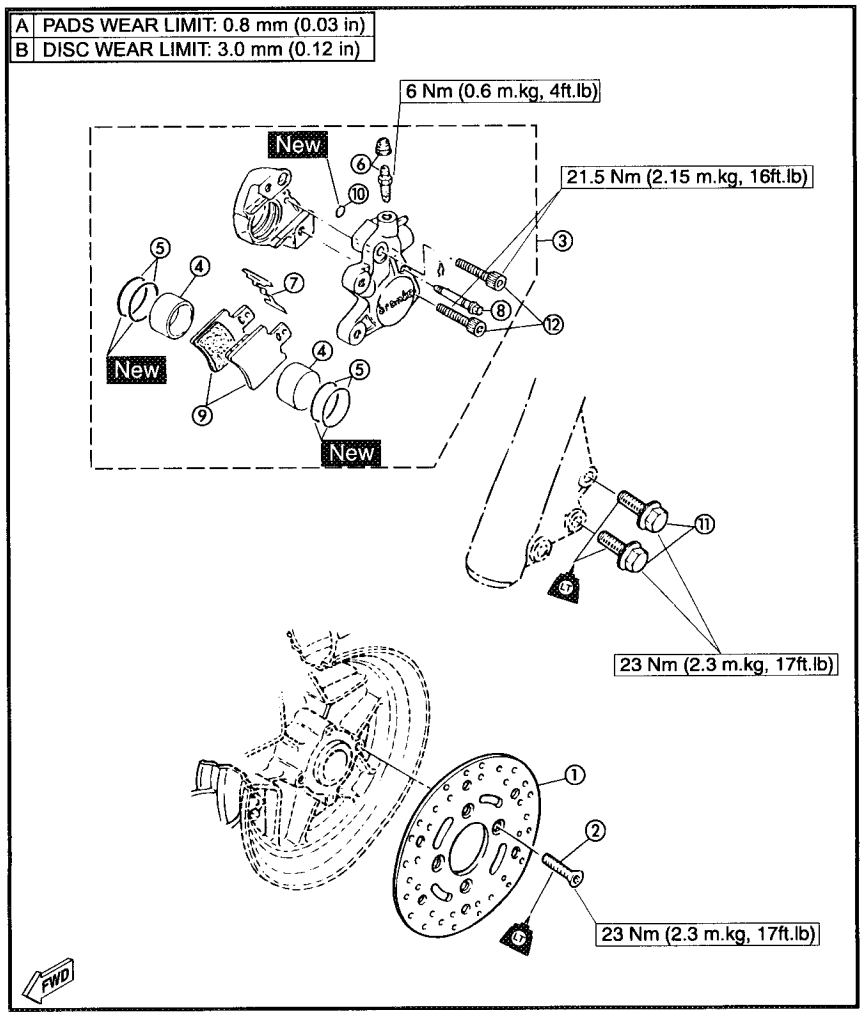
Make sure that the brake hoses are routed properly.

FRONT BRAKE

① Disc
② Bolt
③ Caliper
④ Piston
⑤ Piston seals
⑥ Air bleed screw
⑦ Pad spring
⑧ Pad retainer
⑨ Brake pads
⑩ O. ring
⑪ Bolt
⑫ Mounting bolt

NOTE:

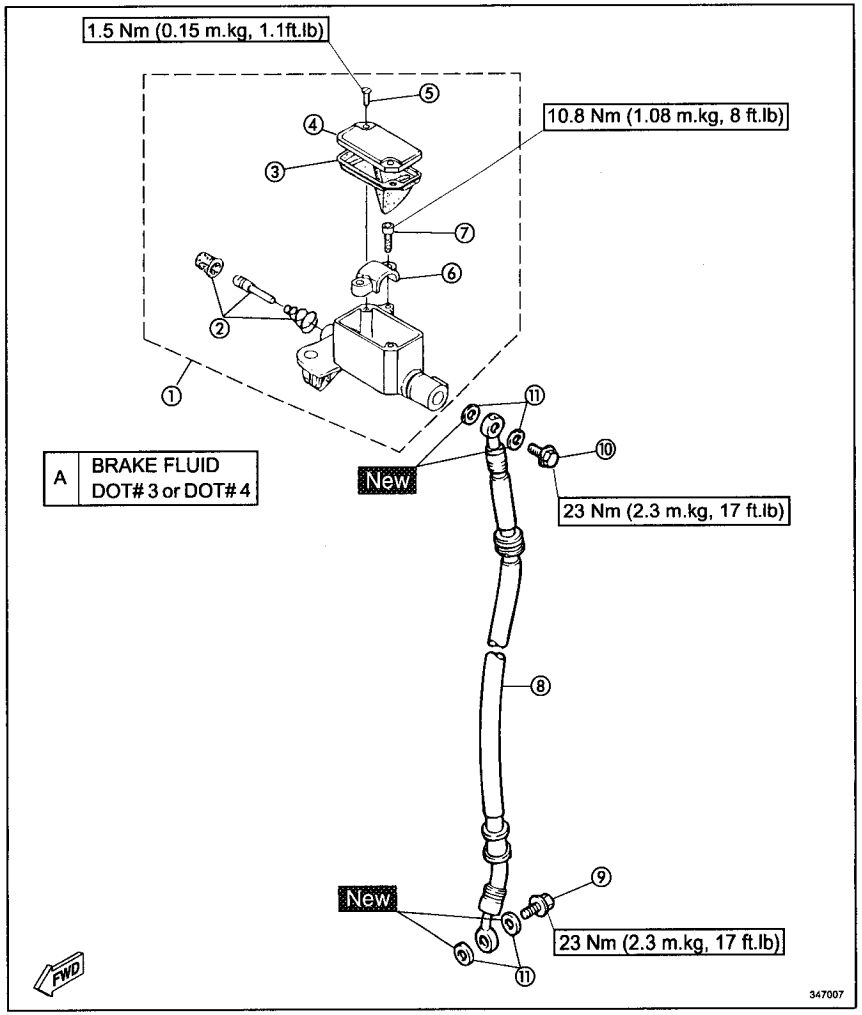
Be sure to install the pads correctly.



MASTER CYLINDER DISASSEMBLY

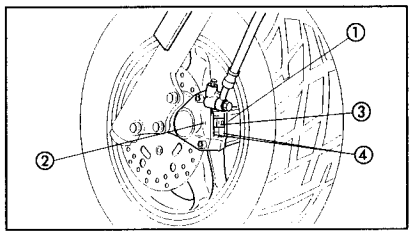
① Master cylinder
② Master cylinder piston ass'y
③ Diaphragm
④ Master cylinder cap
⑤ Screw
⑥ Master cylinder bracket
⑦ Bolt
⑧ Brake hose
⑨ Bolt
⑩ Bolt
⑪ Copper washer

NOTE:
Drain completely before removing the master cylinder.



⚠ WARNING

• Disc brake components rarely require disassembly. Do not disassemble components unless absolutely necessary. If any hydraulic connection is disconnected, the entire system must be disassembled, drained, cleaned, and then properly filled and bled after reassembly. Do not use solvents on internal brake component.
• Solvents will cause seals to swell and distort. Use only clean brake fluid for cleaning. Use care with brake fluid. Never allow brake fluid to come in contact with the eyes. Brake fluid can damage painted surfaces and plastic parts.



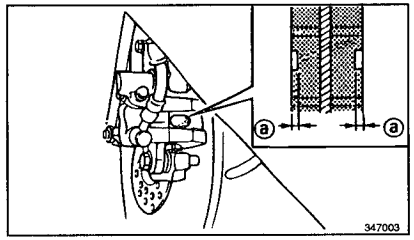
BRAKE PAD REPLACEMENT

It is not necessary to disassemble the brake caliper and brake hose to replace the brake pads.

1. Remove:
   • Pin ①
   • Axle ②

2. Remove:
   • Pad spring ③
   • Brake pads ④

NOTE:
Replace the brake pads as a set when either one is worn to the limit.



3. Measure:
   • Brake pads
   Out of specification → Replace.

NOTE:
Replace the brake pad and spring as a set when replacing the brake pads.

Front Brake Pads Wear Limit @:
0.8 mm (0.03 in)

4. Install:
   - Brake pads
   - Pad spring
   - Axle
   - Pin

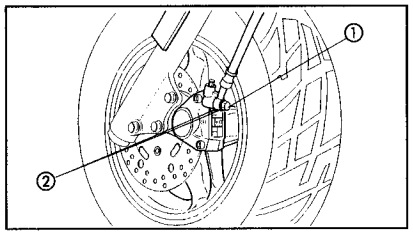
NOTE:
Be careful to install the brake pads correctly.

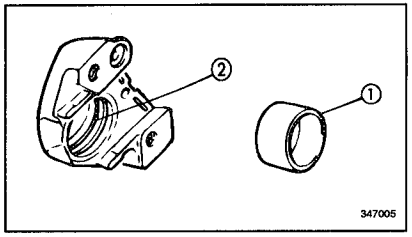
5. Lubricate:
   - Mounting bolt (caliper body)

Recommended lubricant:
Lithium soap base grease

6. Install:
   - Wheel axle
   - Mounting bolt

Wheel axle:
47 Nm (4.7 m.kg, 34 ft.lb)
Mounting bolt:
23 Nm (2.3 m.kg, 17 ft.lb)





CALIPER DISASSEMBLY

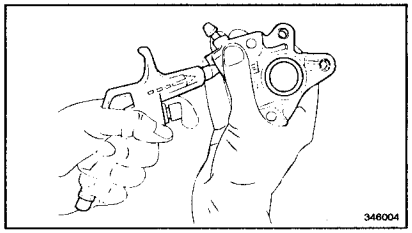
NOTE:
Before disassembling the front brake caliper, drain all brake fluid from the brake hose, master cylinder, brake caliper and tank.

1. Remove:
   - Union bolt ①
   - Copper washers ②

NOTE:
Place the open end of the drain hose into a container and pump out the remaining brake fluid carefully.

2. Remove:
   - Caliper body
   - Caliper bracket

3. Remove:
   - Piston ①
   - Piston seals ②



Removal steps:
- Blow compressed air into the hose joint opening to force out the piston from the caliper body.

⚠ WARNING
• Never try to pry out the piston.
• Cover the piston with a rag. Use care so that the piston does not cause injury as it is expelled from the cylinder.

- Remove the piston seals.

MASTER CYLINDER DISASSEMBLY

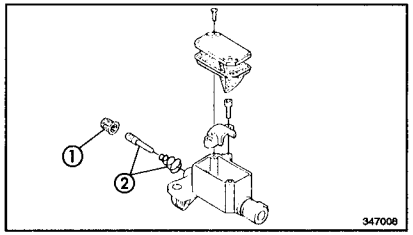
NOTE:
Before disassembling the front brake master cylinder, drain all brake fluid from the brake hose, master cylinder, brake caliper and reservoir tank.

1. Remove:
   - Upper handlebar cover

2. Remove:
   - Brake switch
   - Brake lever
   - Union bolt

NOTE:
Release the brake switch by pushing with a screw driver into the hole on the lower side of the brake lever and pull out the brake switch.

3. Remove:
   - Master cylinder holder
   - Master cylinder



4. Remove:
   • Master cylinder dust boot ①
   • Master cylinder kit ②

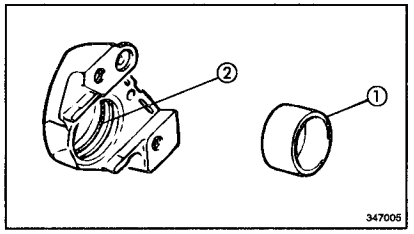
INSPECTION AND REPAIR

Recommended brake component replacement schedule:

Brake pads	As required
Piston seal, Dust seal	Every two years
Brake hoses	Every four years
Brake fluid	Replace only when brakes are disassembled

⚠ WARNING

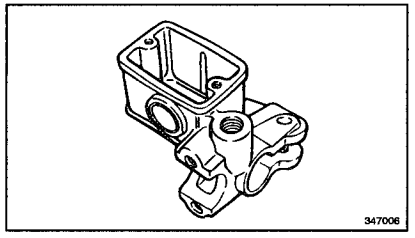
All internal parts should be cleaned in new brake fluid only. Do not use solvents as they will cause seals to swell and distort.



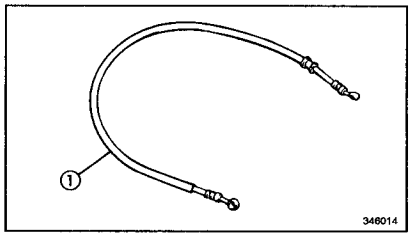
1. Inspect :
   • Caliper piston ①
   Scratches/Rust/Wear → Replace caliper assembly.
   • Caliper body ②
   Wear/Scratches/Cracks/Damage → Replace caliper assembly.

⚠ WARNING

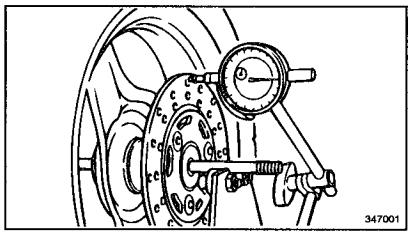
Replace the piston seals whenever the caliper is disassembled.



2. Inspect:
   • Master cylinder
   Wear/Scratches → Replace the master cylinder assembly.
   • Master cylinder body/Diaphragm
   Cracks/Damage → Replace.
   • Master cylinder kit
   Scratches/Wear/Damage → Replace as a set.

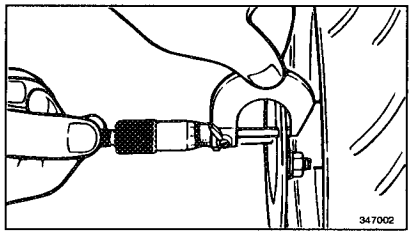


3. Check:
   • Brake hose ①
   Cracks/Wear/Damage → Replace.



4. Measure:
   • Brake disc deflection
   Out of specification → Inspect wheel runout.
   If wheel runout is good, replace the brake disc.

Brake Disc Maximum Deflection: 0.25 mm (0.01 in)



   • Brake disc thickness
   Out of specification → Replace.

Brake Disc Minimum Thickness: 3 mm (0.12 in)

Bolt (brake disc): 23 Nm (2.3 m.kg, 17 ft.lb) LOCTITE®

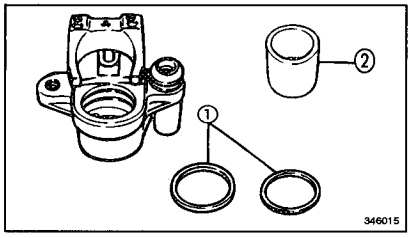
CALIPER ASSEMBLY

⚠ WARNING

• All internal parts should be cleaned in new brake fluid only.
• Internal parts should be lubricated with clean brake fluid when installed.

Recommended brake fluid: DOT #3 or DOT #4

• Replace the piston seals whenever a caliper is disassembled.



1. Install:
   • Piston seals ①
   • Caliper piston ②

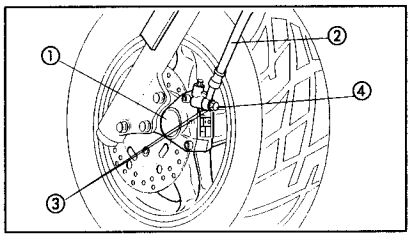
⚠ WARNING

Always use new piston seals.

2. Install:
   • Brake caliper

	Bolt (brake caliper): 23 Nm (2.3 m.kg, 17 ft.lb)

3. Install:
   • Caliper body ①



4. Install:
   • Brake hose ②
   • Copper washers ③
   • Union bolt ④

	Union Bolt (brake hose): 23 Nm (2.3 m.kg, 17 ft.lb)

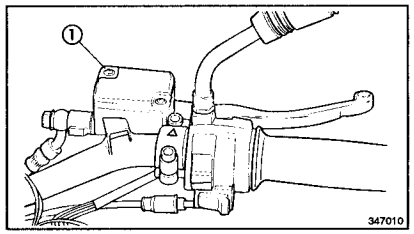
CAUTION:
When installing the brake hose to the caliper, turn the brake pipe against the projection on the caliper.

⚠ WARNING
• Proper hose routing is essential to insure safe operation. Refer to "CABLE ROUTING".
• Always use new copper washers.

MASTER CYLINDER ASSEMBLY

⚠ WARNING
• All internal parts should be cleaned in new brake fluid only.
• Internal parts should be lubricated with clean brake fluid when installed.

	Recommended brake fluid: DOT #3 or DOT #4



1. Install:
   • Master cylinder ①

CAUTION:
• Install the master cylinder holder with the arrow mark pointing upwards.
• Tighten the upper bolt first, then the lower bolt.

	Bolt (master cylinder holder): 9 Nm (0.9 m.kg, 6.5 ft.lb)

2. Install:
   • Brake lever

NOTE:
Apply lithium soap base grease to the brake lever pivot.

3. Install:
   • Brake hose
   • Copper washers
   • Union bolts
   • Brake switch

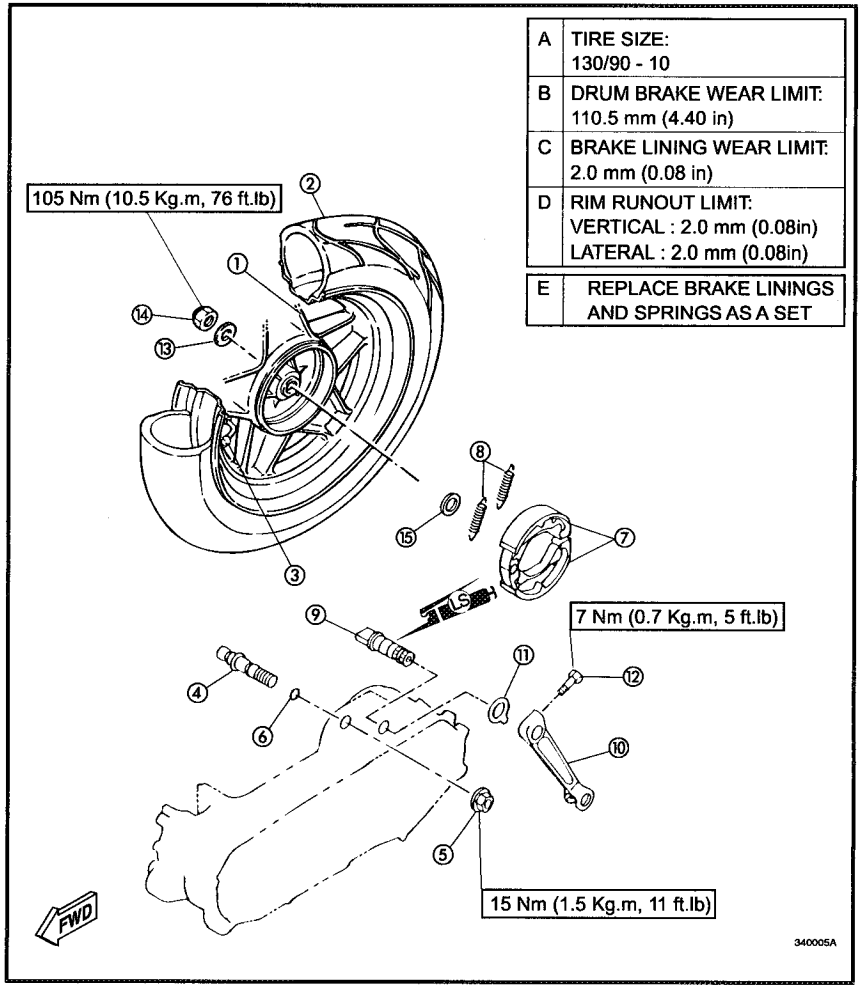
	Union bolt: 23 Nm (2.3 m.kg, 17 ft.lb)

⚠ WARNING
• Proper hose routing is essential to insure safe operation. Refer to "CABLE ROUTING" in CHAPTER 2.
• Always use new copper washers.

4. Check that the brake hose does not touch other parts (throttle cable, wire harness, etc.) when the handlebar is turned to the left or right. Repair if necessary.

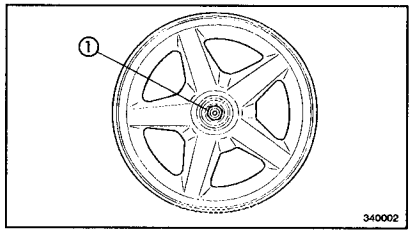
REAR WHEEL

① Rear wheel ass'y
② Tire
③ Valve
④ Axle
⑤ Nut
⑥ O-ring
⑦ Brake shoe
⑧ Spring
⑨ Brake camshaft
⑩ Brake camshaft lever
⑪ Wear indicator
⑫ Bolt
⑬ Washer
⑭ Nut
⑮ Washer



REMOVAL

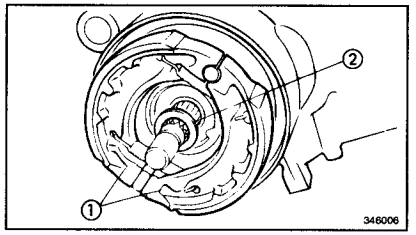
1. Remove:
   • Muffler ass'y



2. Loosen:
   • Rear axle nut ①

NOTE:
Pull the rear brake to loosen the axle nut.

3. Remove:
   • Rear wheel

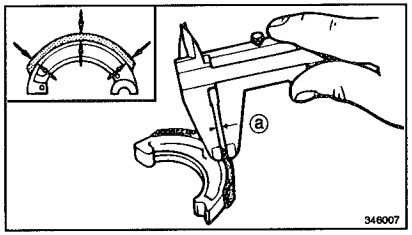


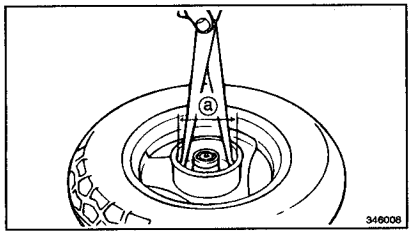
4. Remove:
   • Brake cable
   • Brake shoes ①
   • Plain washer ②

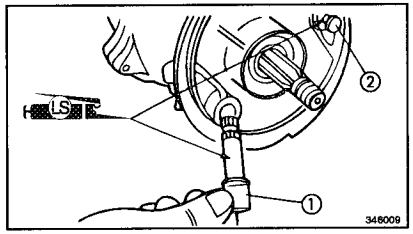
INSPECTION

1. Check:
   • Rear wheel
   Refer to the section "FRONT WHEEL INSPECTION".
2. Measure:
   • Wheel runout
   Refer to the section "FRONT WHEEL INSPECTION".

Rim Runout Limits:
Radial: 2.0 mm (0.08 in)
Lateral: 2.0 mm (0.08 in)







3. Check:
   • Wheel bearings
   Refer to the section "FRONT WHEEL INSPECTION".

4. Check:
   • Brake lining surface
   Glazed spots → Eliminate with sandpaper.

NOTE:
After sanding the brake lining remove dust particles from the brake shoe with a clean cloth.

5. Measure:
   • Brake lining thickness
   Out of specification → Replace

Brake Lining Thickness:
4.0 mm (0.16 in)
Wear limit:
2.0 mm (0.08 in)

6. Check:
   • Brake drum inner surface
   Oil/Scratches → Repair.
7. Measure:
   • Brake drum inside diameter @
   Out of specification → Replace.

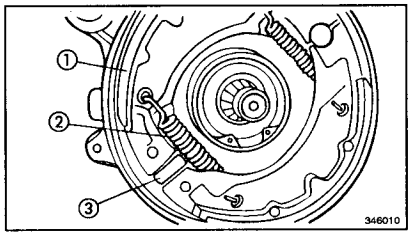
Brake Drum Wear limit:
110.5 mm (4.35 in)

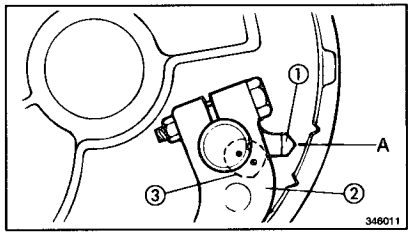
ASSEMBLY
Reverse the "REMOVAL" procedure.
Note the following points.

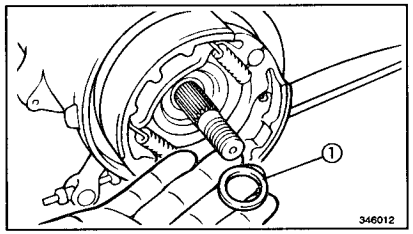
1. Install:
   • Brake camshaft ①

NOTE:
Apply lithium soap base grease onto the brake camshaft ① and pin ②.

CAUTION:
After installing the brake camshaft, remove the excess of grease.







2. Install:
   • Brake shoes ①
   • Return spring ②

NOTE:
The arrow mark ③ must point outwards.

CAUTION:
When installing the springs and the brake shoes, take care not to damage the springs

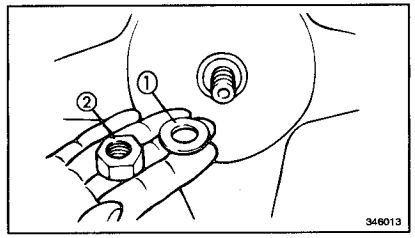
3. Install:
   • Wear indicator ①
   • Camshaft lever ②

NOTE:
• Align the wear indicator tip ① with the line "A" as shown.
• Align the punch marks ③.

Camshaft Lever Bolt:
7 Nm (0.7 m.kg, 5.1 ft.lb)

4. Install:
   • Plain washer ①
   • Brake cable

INSTALLATION
Reverse the REMOVAL procedure.
Note the following points.
1. Clean:
   • Rear wheel axle



2. Install:
   • Rear wheel
   • Plain washer ①
   • Nut ②

NOTE:
Make sure the splines on the wheel hub fit onto the rear drive axle.

	Nut (Rear Wheel Axle): **105 Nm (10.5 m.kg, 76 ft.lb)**

3. Install:
   • Muffler

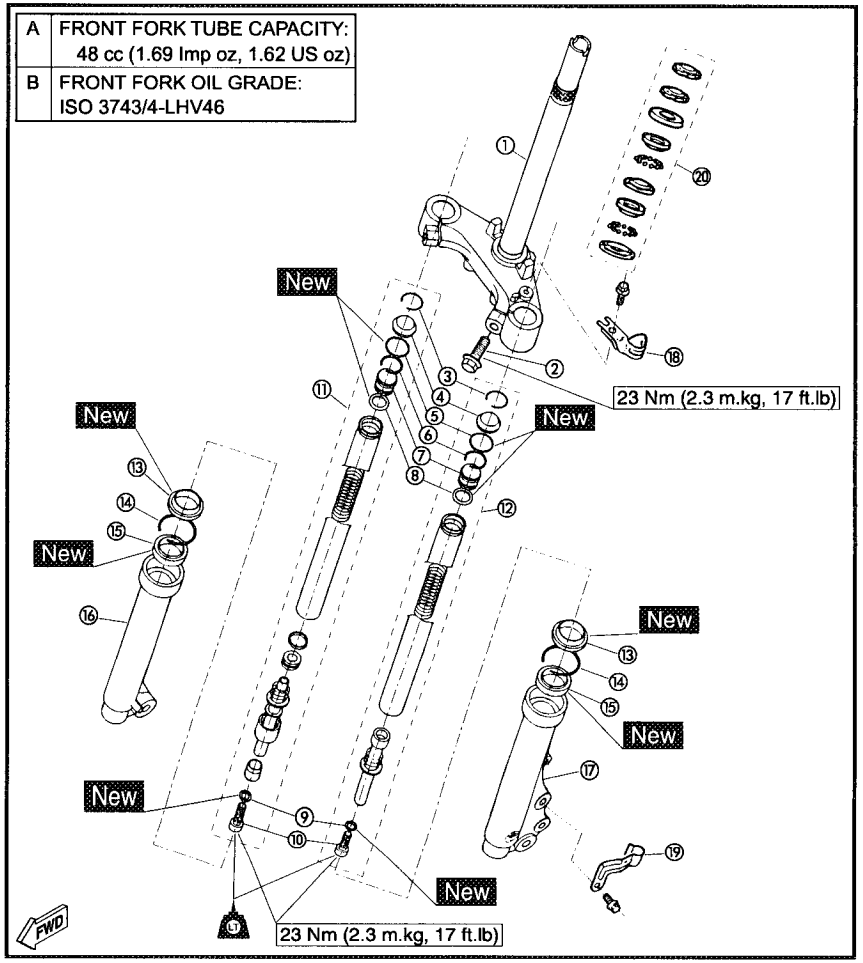
	Bolt (exhaust pipe): **9 Nm (0.9 m.kg, 6.5 ft.lb)** **Bolt (muffler):** **26 Nm (2.6 m.kg, 19 ft.lb)**

4. Adjust:
   • Rear brake lever free play.

Refer to "REAR BRAKE LEVER FREE PLAY ADJUSTMENT"in CHAPTER 3.

FRONT FORK

① Steering bracket
② Bolt
③ Circlip
④ Tube cap
⑤ Oil seal
⑥ Circlip
⑦ Plunger guide
⑧ Oil seal
⑨ Washer
⑩ Bolt
⑪ Inner fork tube (right)
⑫ Inner fork tube (left)
⑬ Dust boot
⑭ Retainer
⑮ Oil seal
⑯ Outer fork tube (right)
⑰ Outer fork tube (left)
⑱ Brake hose bracket
⑲ Brake hose bracket
⑳ Steering race set



REMOVAL

⚠ WARNING

Securely support the scooter with a stand under the engine.

1. Place the scooter on an even surface.
2. Disconnect:
   - Speedometer cable
3. Remove:
   - Front wheel

Refer to "FRONT WHEEL".

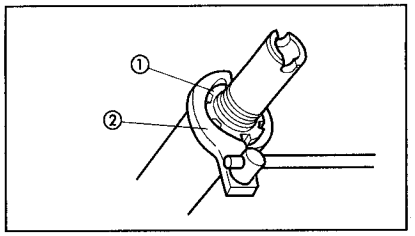
4. Remove:
   - Front fender

Refer to "COVERS" in CHAPTER 3.

5. Remove:
   - Steering head

Refer to "STEERING HEAD AND HANDLEBAR".

6. Remove:
   - Securing nut
   - Ring nut ①

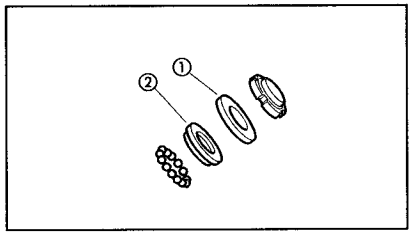


NOTE:

Use the Ring Nut Wrench ② to loosen the ring nut.

Ring Nut Wrench:
90790-01268

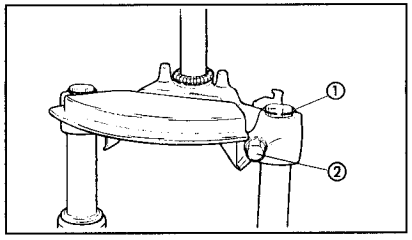
Support the steering shaft to prevent it from falling.



7. Remove :
   - Washer ①
   - Upper bearing race (top) ②
   - Steering collumn
   - Bearings

NOTE:

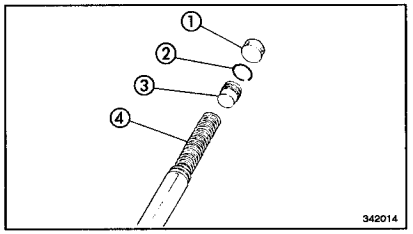
Take care not to loose the bearings. (Upper: 22 pieces, Lower: 22 pieces).



8. Remove:
   - Circlip ①

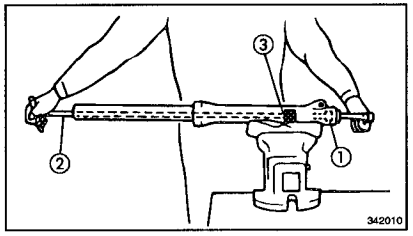
9. Loosen:
   - Pinch bolt ②

10. Remove:
    - Fork leg (complete)



DISASSEMBLY

1. Remove:
   - Rubber plug ①
   - Circlip ②
   - Spring seat ③
   - Spring ④

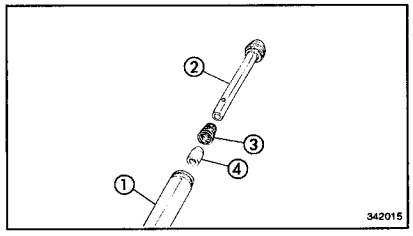


2. Remove:
   - Bolt ①
   - Copper washer

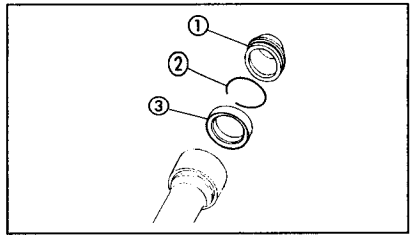
NOTE:

To remove the drain bolt ①, use the T-handle ② and the holder ③.

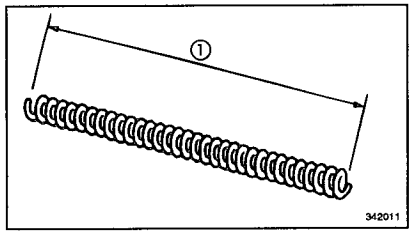
T-handle for front fork:
90890-01326
Holder:
90890-01294



3. Remove:
   - Inner fork tube ①
   - Piston ②
   - Spring ③
   - Spring seat ④



4. Remove:
   - Dust boot ①
   - Retainer ②
   - Oil seal ③



INSPECTION

1. Check:
   - Inner fork tube and fork components
   - Outer fork tube

   Wear/Scratches/Damage → Replace.

⚠ WARNING

Never attempt to straighten a bent fork tube as this may dangerously weaken the tube.

2. Measure:
   - Fork spring free length ①

   Out of specification → Replace.

Front fork spring free length:
Right side: 206 mm (8.11 in)
Left side: 225 mm (8.85 in)

ASSEMBLY

Reverse the "DISASSEMBLY" procedure.
Note the following points.

NOTE:

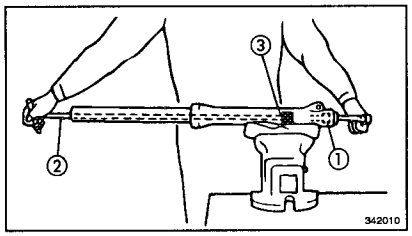
- When reassembling the front fork, make sure you use following new parts:
- Oil seals
- Circlips and retainers
- Make sure that all components are clean before reassembling.

1. Install:
   - Oil seal
   - Retainer
   - Dust boot

NOTE:

Before installing the oil seal, apply lithium soap grease onto the oil seal lips.

2. Install:
   - Inner fork tube
   - Spring seat
   - Spring
   - Piston



3. Install:
   - Copper washer (New)
   - Drain bolt

NOTE:

Tighten the drain bolt ① while holding the piston with the T-handle ② and holder ③.

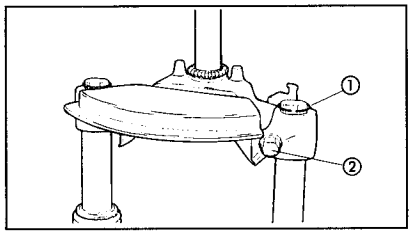
T-handle for front fork:
90890-01326
Holder :
90890-01294

Drain Bolt:
23 Nm (2.3 m.kg, 17ft.lb)

4. Fill:
   - Fork oil

Fork oil type:
ISO 6743/4-LHV 46
Amount (per fork tube):
48 cc (1.69 Imp oz, 1.62 US oz)

5. Install:
   - Spring
   - Spring seat
   - Circlip
   - Rubber plug



INSTALLATION

Reverse the "REMOVAL" procedure.
Note the following points.

1. Install:
   - Left and right fork tube into the steering crown.

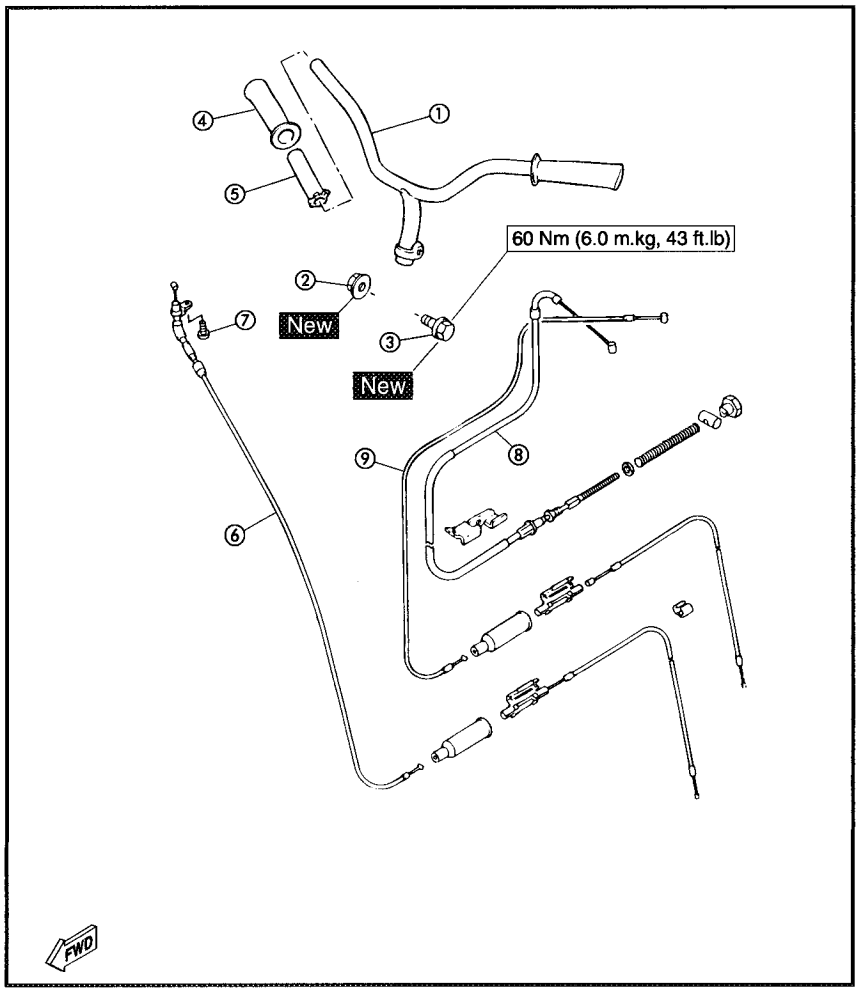
2. Install:
   - Circlips ①

3. Install:
   - Pinch bolts ②

Pinch bolt :
30 Nm (3.0 m.kg, 21.7 ft.lb)

STEERING HEAD AND HANDLEBAR

① Handlebar
② Nut
③ Bolt
④ Grip
⑤ Throttle grip
⑥ Throttle cable
⑦ Screw
⑧ Brake cable
⑨ Starter cable



STEERING HEAD AND HANDLEBAR

REMOVAL

⚠ WARNING

Securely support the scooter so there is no danger of it falling over.

1. Place the scooter on an even surface.

2. Remove:
   - Front fender
   - Inner panels
   - Upper handlebar cover

Refer to "COVERS" in CHAPTER 3.

3. Drain:
   - Front brake system

Refer to "FRONT BRAKE".

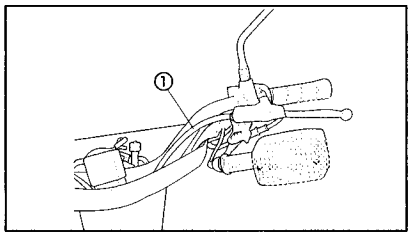
4. Remove:
   - Front brake master cylinder

Refer to "FRONT BRAKE".

5. Remove :
   - Front brake caliper mounting bolts

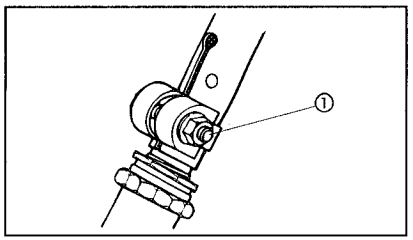
6. Remove:
   - Front wheel

Refer to "FRONT BRAKE".

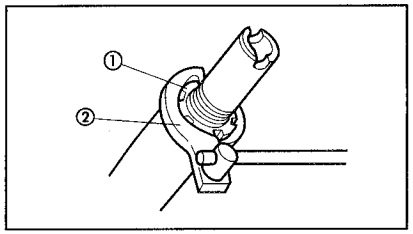


7. Remove:
   - Rear brake cable ①
   - Throttle grip

8. Disconnect:
   - Ground wire
   - All couplers
   - Wire harness band
   - Clamp



9. Remove:
   - Nut ①
   - Bolt
   - Handlebar

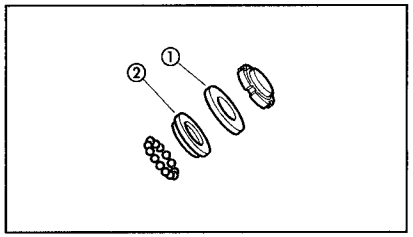


10. Remove:
    - Securing nut
    - Ring nut ①
    - Washer

NOTE:
Use the Ring Nut Wrench ② to loosen the ring nut.

Ring Nut Wrench:
90890-01268

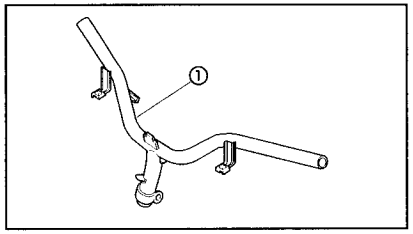
Support the front fork so that it may not fall down.



11. Remove:
    - Washer ①
    - Upper bearing race ②
    - Steering shaft
    - Bearing balls

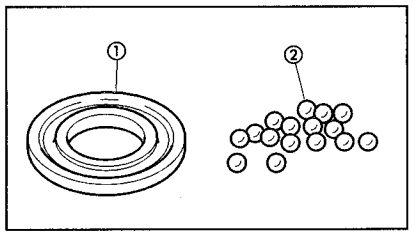
NOTE:
Take care not to loose the bearing balls. (Upper: 22 pieces, Lower: 22 pieces).

INSPECTION



1. Check:
    - Handlebar ①
    Bends/Cracks/Damage → Replace.

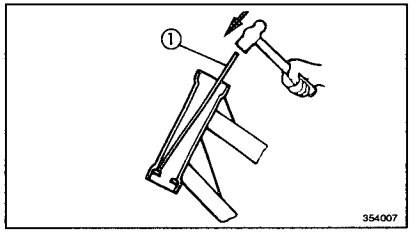
2. Wash the bearing balls in solvent.



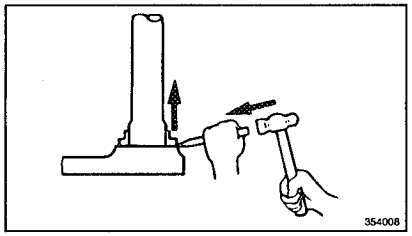
3. Check:
    - Bearing races ①
    Pitting/Damage → Replace.
    - Bearing balls ②
    Pitting/Damage → Replace.

NOTE:
Always replace the bearing balls and the upper and lower bearing races as a set.

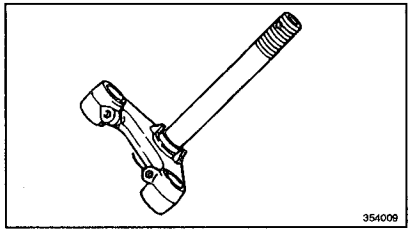
Bearing size:
Upper: 3/16 in
Lower: 3/16 in
Bearing quantity:
Upper: 22 pcs
Lower: 22 pcs



Bearing race replacement steps:
- Drive out the bearing race from the steering tube by hitting on it in several places.
- Remove the bearing race on the steering shaft with a hammer and a chisel Q as shown.
- Drive in the new bearing races evenly by hitting on them in several places.



CAUTION:
• Unless the ball race is installed evently, it will damage the frame or steering column.
• Do not hit the face of the ball race.

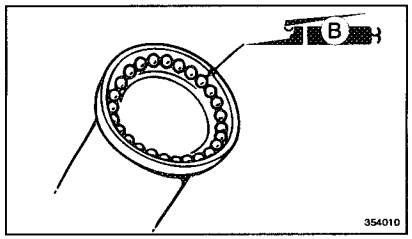


4. Check:
    - Steering shaft
    Bend/Damage → Replace.

⚠ WARNING
Never attempt to straighten a bent steering shaft.

ASSEMBLY AND INSTALLATION
Reverse the "REMOVAL" and "DISASSEMBLY" procedure.
Note the following points.

⚠ WARNING
Proper cable and hose routing is essential to insure safe scooter operation. Refer to "CABLE ROUTING" in CHAPTER 2.



1. Install:
    - Bearing balls

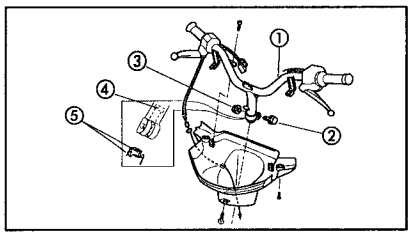
2. Apply:
    - Wheel bearing grease (to upper and lower bearing).

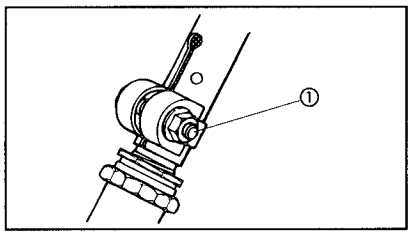
3. Install:
   • Steering shaft
   • Upper bearing race (Top) ①
   • Bearing race cover ②
   • Washer
   • Ring nut

NOTE:
Hold the steering column until it is secured.

4. Tighten:
   • Ring nut

NOTE:
Refer to "STEARING HEAD ADJUSTMENT" in CHAPTER 3.





7. Install:
   • Handlebar ①
   • Bolt ② (New)
   • Nut ③ (New)

NOTE:
• Fit the handlebar bridge ④ into the steering column notcher ⑤.

NOTE:
Refer to "CABLE ROUTING" in CHAPTER 2 for proper cable and lead routing.

CAUTION:
• Before installing the handlebar, wipe the oil off the insertion portion using thinner, etc.
• Install the bolt ① from the left as shown.

Handlebar Bolt ①:
60 Nm (6.0 m.kg, 43.4 ft.lb)

8. Install:
   • Band

NOTE:
Refer to "CABLE ROUTING" in CHAPTER 2.

9. Clamp:
   • Speedometer cable
   • Front brake cable
   (to head pipe with the band)

NOTE:
Refer to "CABLE ROUTING" in CHAPTER 2.

10. Apply:
   • Lithium soap base grease
   (to throttle cable end and handlebar right end).
11. Install:
   • Throttle grip
   • Throttle cable
   • Bracket
   • Front brake lever assembly
   • Handlebar switch (right)

NOTE:
Refer to "CABLE ROUTING" in CHAPTER 2.

12. Connect:
   • Rear brake cable
   • Handlebar switch leads
   • Brake switch lead

13. Install:
   • Front fender

NOTE:
Refer to "COVERS" in CHAPTER 3.

13. Adjust:
   • Front brake free play
   • Rear brake lever free play
   • Throttle free play

Front Brake Lever Free Play:
10 ~ 20 mm (0.4 ~ 0.8 in)
Rear Brake Free Play:
10 ~ 20 mm (0.4 ~ 0.8 in)
Throttle Cable Free Play:
1.5 ~ 3.0 mm (0.06 ~ 0.12 in)

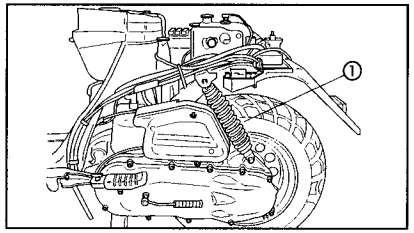
NOTE:
Refer to "FRONT BRAKE ADJUSTMENT-REAR BRAKE ADJUSTMENT-THROTTLE CABLE ADJUSTMENT" in CHAPTER 3.

REAR SHOCK ABSORBER

REMOVAL

1. Place the scooter on its centerstand
2. Remove:
   • Mole

Refer to "COVERS" in CHAPTER 3.



3. Remove:
   • Rear shock absorber ①

INSPECTION

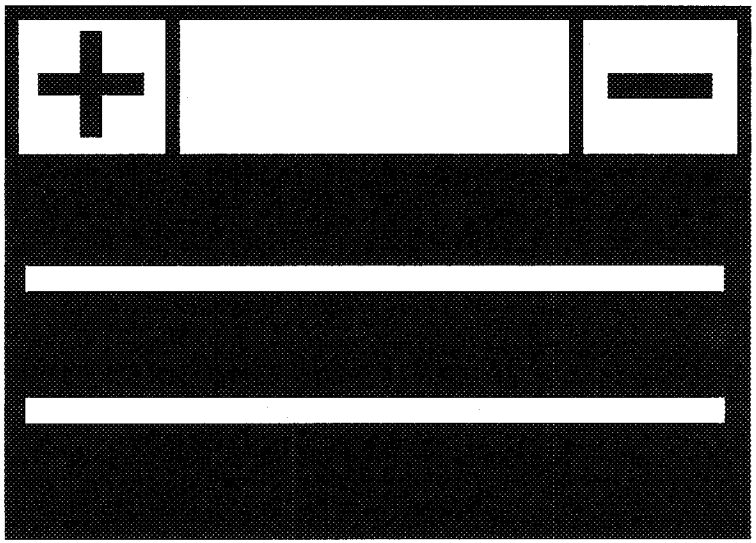
1. Inspect:
   • Rear shock absorber
   Oil leaks/Damage → Replace.

INSTALLATION

When installing the rear shock absorber, reverse the removal procedure. Note the following points.

1. Install:
   • Rear shock absorber

Rear Shock Absorber Bolt (Upper): 31.5 Nm (3.15 m.kg, 22.8 ft.lb)
Rear Shock Absorber Bolt (Lower): 17.5 Nm (1.75 m.kg, 12.6 ft.lb)



ELEC 7

ELEC

CHAPTER 7.
ELECTRICAL COMPONENTS

ELECTRICAL COMPONENTS F-6

SWITCH INSPECTION F-6
- SWITCH INSPECTION F-6
- SWITCH CONTINUITY INSPECTION F-7

CIRCUIT DIAGRAM F-8

IGNITION AND STARTING SYSTEM F-9
- CIRCUIT DIAGRAM F-9
- IGNITION AND STARTING SYSTEM CIRCUIT DIAGRAM F-9
- TROUBLESHOOTING F-10

CHARGING SYSTEM F-14
- CIRCUIT DIAGRAM F-14
- TROUBLESHOOTING F-14

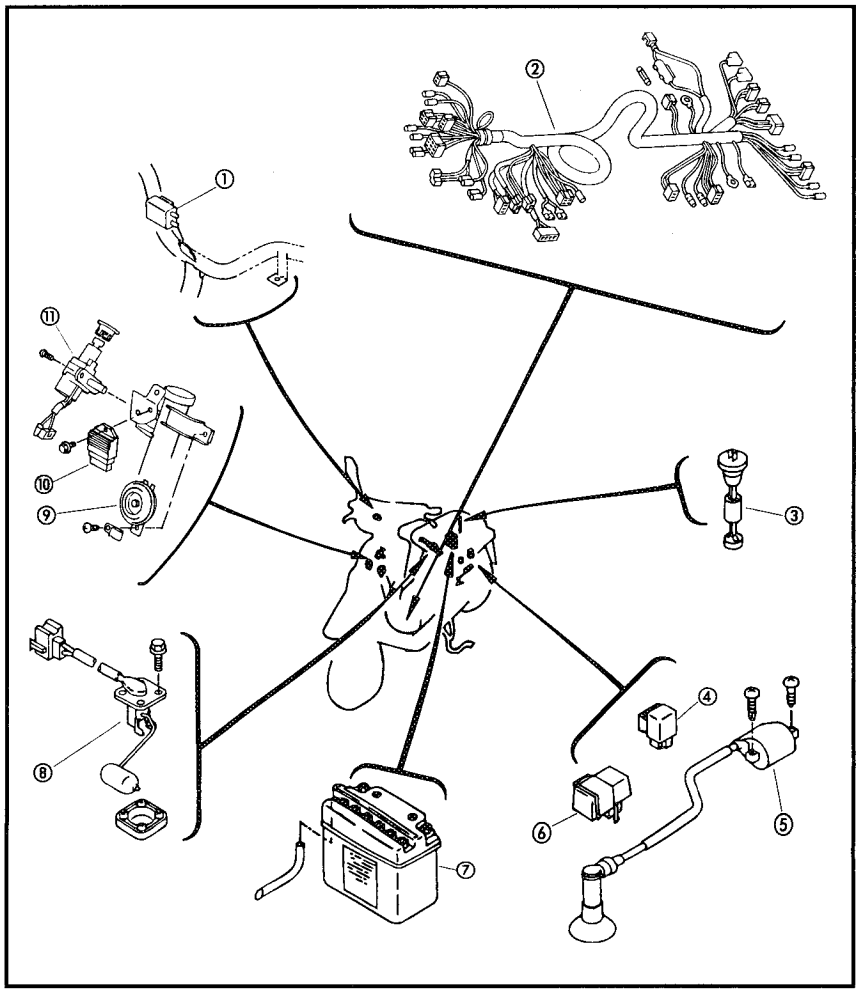
LIGHTING SYSTEM F-15
- CIRCUIT DIAGRAM F-15
- TROUBLESHOOTING F-16

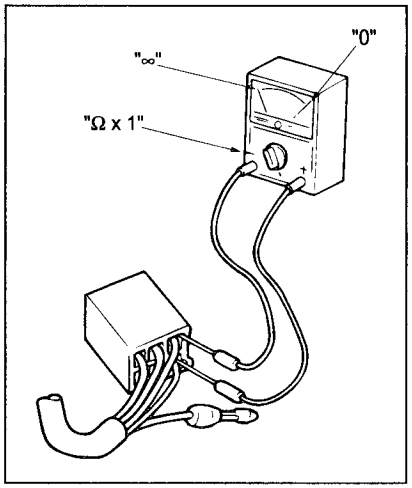
SIGNAL SYSTEM G-1
- WIRING DIAGRAM G-1
- TROUBLESHOOTING G-2

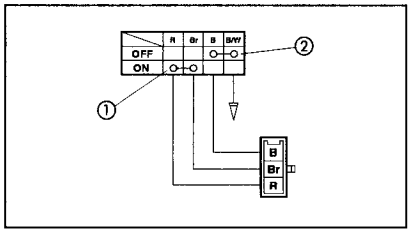
ELECTRICAL

ELECTRICAL COMPONENTS

① Flasher relay
② Wire harness
③ Oil sender
④ Starter relay
⑤ Ignition coil
⑥ CDI unit
⑦ Battery
⑧ Fuel sender
⑨ Horn
⑩ Rectifier/regulator
⑪ Main switch







SWITCH INSPECTION

SWITCH INSPECTION

Use a pocket tester to check the terminals for continuity. If the continuity is faulty as any point, replace the switch.

Pocket tester:
90890-03112

NOTE:

- Set the pocket tester to "0" before starting the test.
- The pocket tester should be set to the "x 1" Ω range when testing the switch for continuity.
- Turn the switch on and off a few times when checking it.

INSPECTING A SWITCH SHOWN IN THE MANUAL

The terminal connections for switches (main switch, handlebar switch, engine stop switch, light switch, etc.) are shown in a chart similar to the one on the left.
This chart shows the switch positions in the column and the switch lead colors in the top row. For each switch position, "O—O" indicates the terminals with continuity.

The example chart shows that:

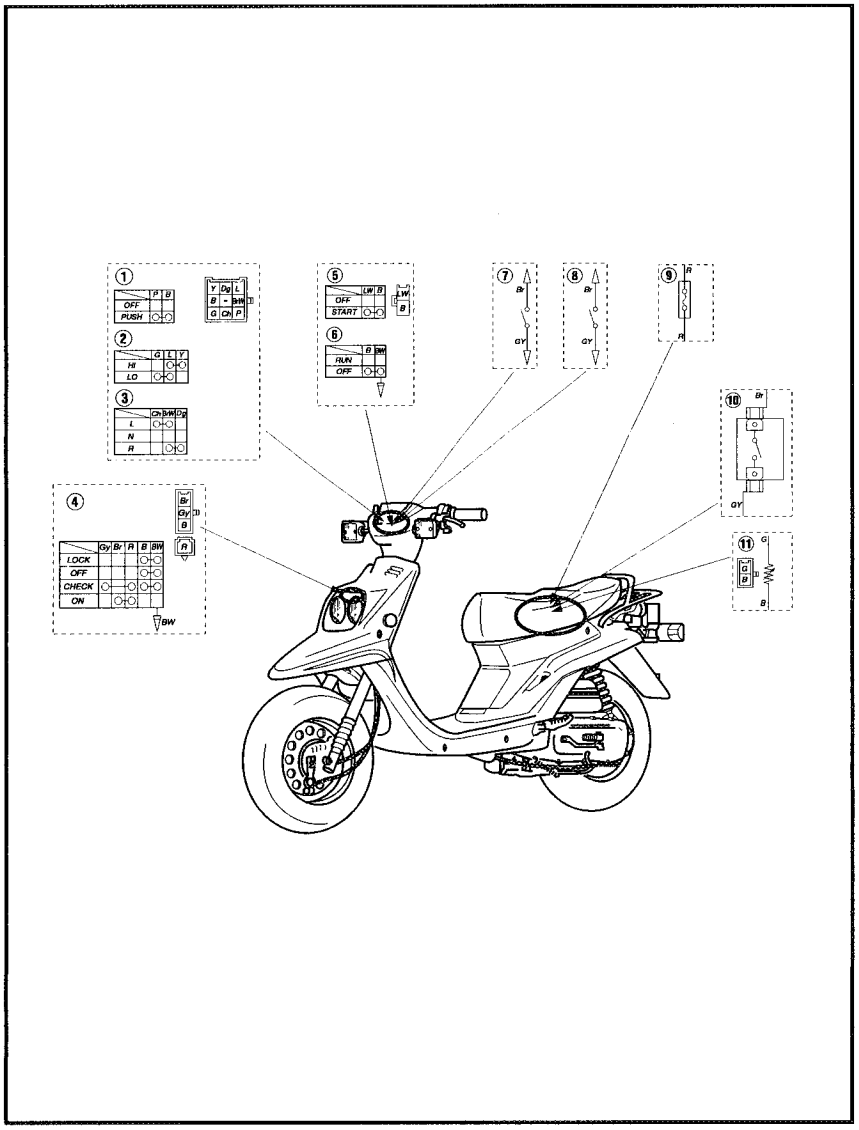
① There is continuity between the "black and Black/White" leads when the switch is set to "OFF".
② There is continuity between the "Red and Brown" leads when the switch is set to "ON".

SWITCH CONTINUITY INSPECTION

Refer to "SWITCH INSPECTION" and check for continuity between lead terminals.

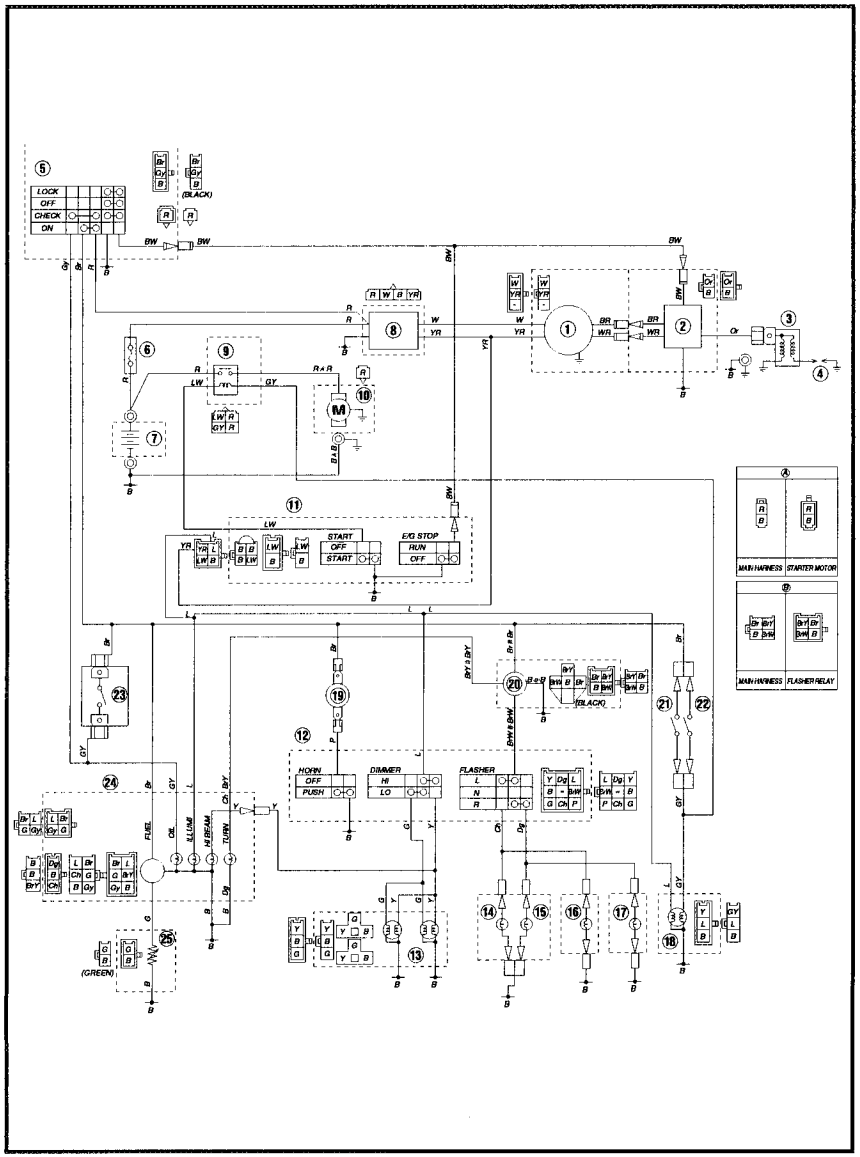
Poor connection, no continuity → Correct or replace.

* The coupler locations are circled.



① Horn switch
② Dimmer switch
③ Turn switch
④ Main switch
⑤ Start switch
⑥ Engine stop switch
⑦ Front stop switch
⑧ Rear stop switch
⑨ Fuse
⑩ Oil lever gauge
⑪ Fuel sender

CIRCUIT DIAGRAM



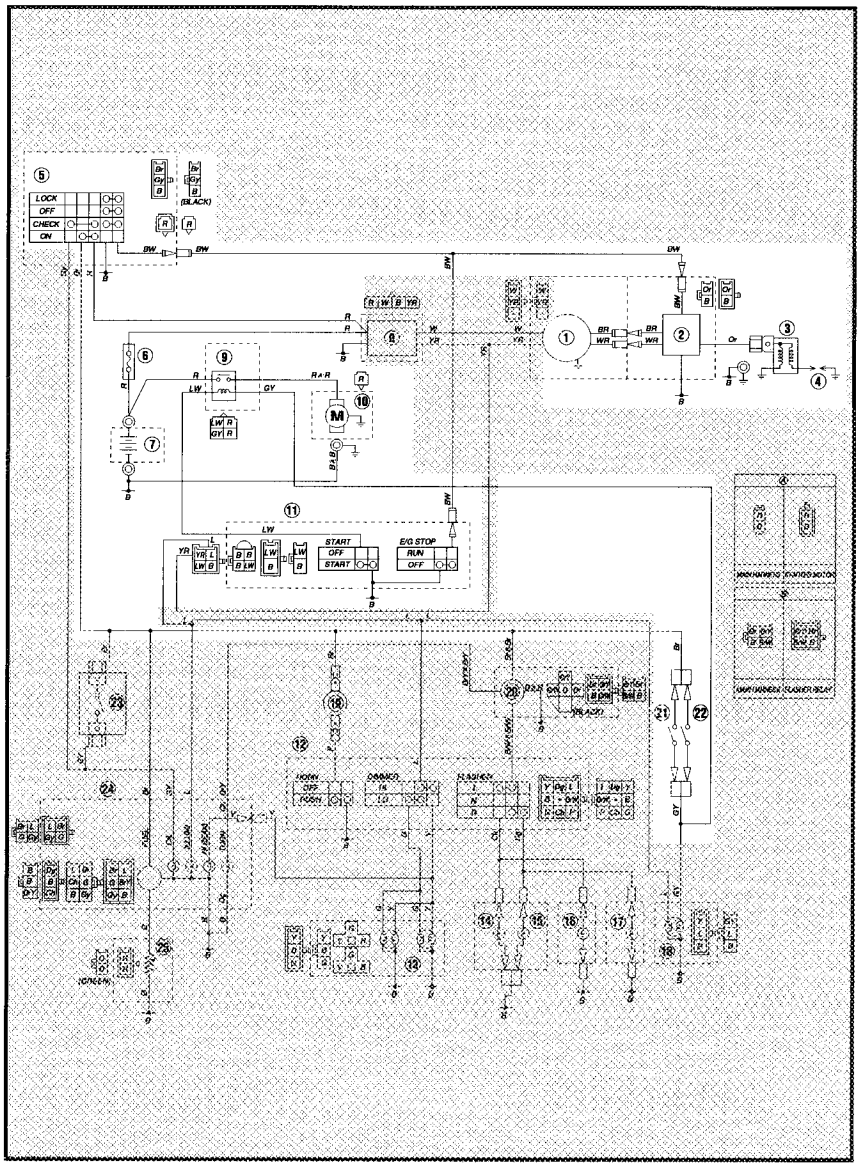
① C.D.I Magneto
② C.D.I Unit
③ Ignition coil
④ Spark plug
⑤ Main switch
⑥ Fuse
⑦ Battery
⑧ Rectifier/regulator
⑨ Starter relay
⑩ Starting motor
⑪ Right handle switch
⑫ Left handle switch
⑬ Head light
⑭ Left front flasher light
⑮ Right front flasher light
⑯ Left rear flasher light
⑰ Right rear flasher light
⑱ Tail/Stop light
⑲ Horn
⑳ Flasher relay
㉑ Front stop switch
㉒ Rear stop switch
㉓ Oil level gauge
㉔ Meter
㉕ Sender

COLOR CODE

R	Red	L	Blue
B	Black	Y/R	Yellow/Red
W	White	L/W	Blue/White
Y	Yellow	G/Y	Green/Yellow
Br	Brown	B/W	Black/White
Gy	Gray	B/R	Black/Red
O	Orange	W/R	White/Red
Ch	Chocolate	Br/W	Brown/White
Dg	Dark green	Y/B	Yellow/Black
G	Green	G/W	Green/White
P	Pink		

IGNITION AND STARTING SYSTEM

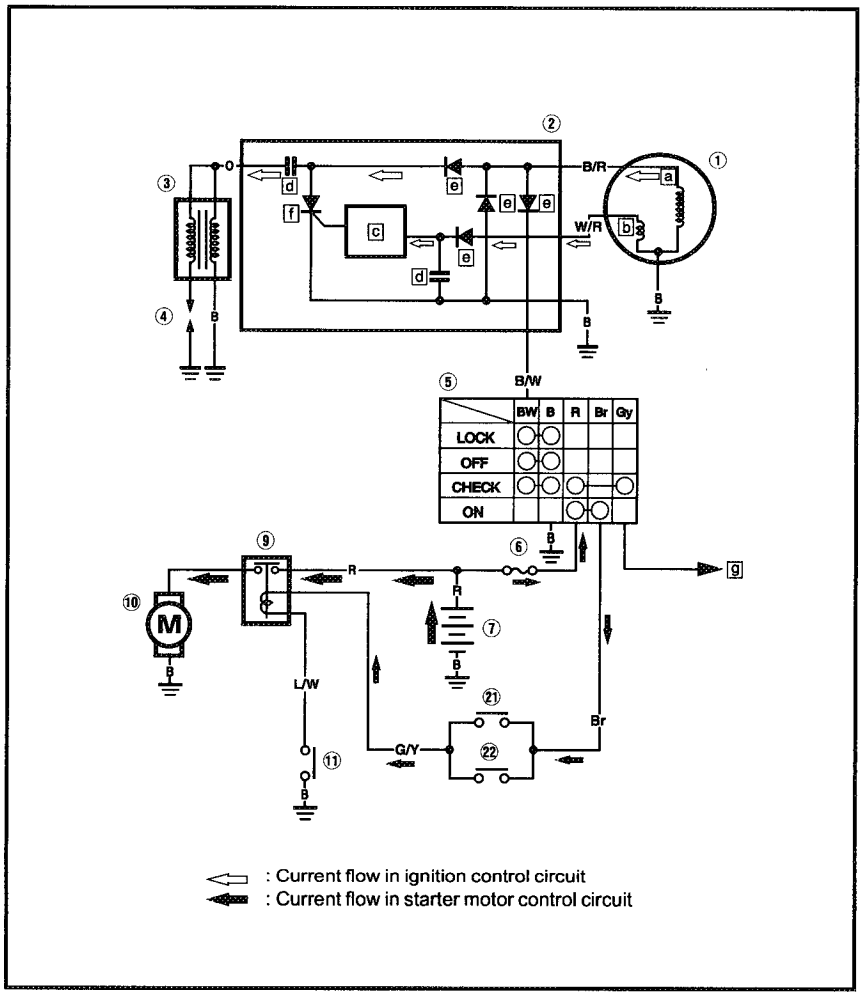
CIRCUIT DIAGRAM



IGNITION AND STARTING SYSTEM CIRCUIT DIAGRAM

① C.D.I magneto
② C.D.I unit
③ Ignition coil
④ Spark plug
⑤ Main switch
⑥ Fuse
⑦ Battery
⑨ Starter relay
⑩ Starting motor
⑪ Right handle switch
㉑ Front brake switch
㉒ Rear brake switch

[a] Source coil
[b] Pickup coil
[c] Wave-shape shaping circuit
[d] Condenser
[e] Diode
[f] SCR
[g] To oil level switch



TROUBLESHOOTING

THE STARTING SYSTEM DOES NOT WORK (NO SPARK OR IRREGULAR SPARKS).

NOTE:
- Remove the following parts before proceeding with the troubleshooting:
  1) Mole
- For accurate troubleshooting use the following special tools:

Ignition checker: 90890-06754	**Pocket tester: 90890-03112**

1. Spark plug:
- Check the spark plug type.
- Check the condition of the spark plug.
- Check the spark plug gap.
  Refer to "SPARK PLUG INSPECTION" in Chapter 3.

Standard spark plug: BR8HS (NGK)

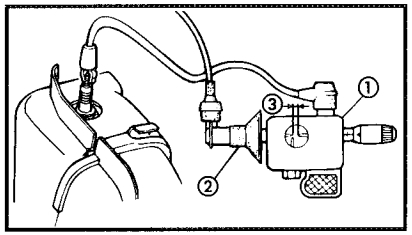
Spark plug gap: 0.5 ~ 0.7 mm (0.020 ~ 0.027 in)

INCORRECT → Replace or adjust the spark plug gap.

CORRECT ⇩

2. Spark check:
- Remove the spark plug cap.
- Connect the ignition checker ①.
  ②Spark plug cap
  ③Spark
- Check the length of the spark gap.
- Start the engine and increase the spark length until the engine begins to misfire.

Minimum spark gap: 6.0 mm (0.24 in)

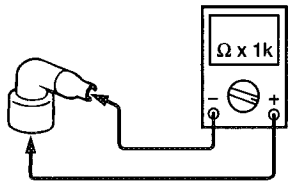


MEETS SPECIFICATION → Ignition system in good condition.

OUT OF SPECIFICATION OR NO SPARK ⇩

3. Spark plug cap resistance:
- Disconnect the spark plug cap.
- Connect the pocket tester (Ω x 1 k) to the spark plug cap.
- Check the resistance of the spark plug cap.

Spark plug cap resistance: 5 kΩ at 20°C (68°F)



OUT OF SPECIFICATION → Replace the spark plug cap.

MEETS SPECIFICATION ⇩

4. Ignition coil resistance:
- Disconnect the ignition coil leads.
- Connect the pocket tester (Ω x 1) to the ignition coil.

Ignition coil:
Pocket tester (+) lead → Orange
Pocket tester (-) lead → Ground

- Check the primary coil resistance.

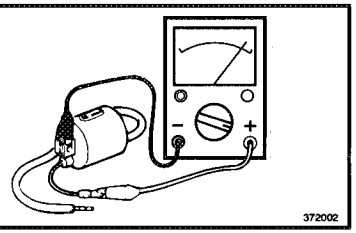
Primary coil resistance: 0.56 ~ 0.84 Ω at 20°C (68°F)

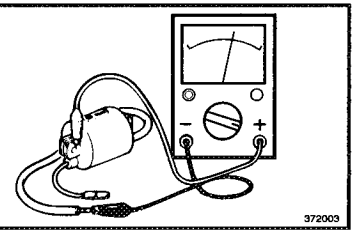
- Connect the pocket tester (Ω x 1k) to the ignition coil.

Pocket tester (+) lead → Ground
Pocket tester (-) lead → Spark plug lead

- Check the secondary coil resistance.

Secondary coil resistance: 5.68 ~ 8.52 kΩ at 20°C (68°F)





OUT OF SPECIFICATION → Replace the ignition coil.

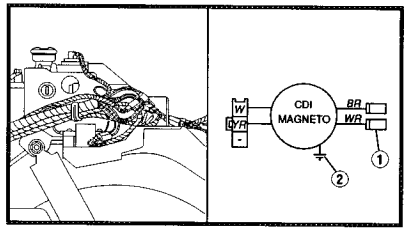
MEETS SPECIFICATION ⇩

5. Pickup coil resistance:
- Disconnect the pickup coil coupler.
- Connect the pocket tester (Ω x 100) to the pickup coil.

Pocket tester (+) lead ① → White / Red
Pocket tester (-) lead ② → Ground

- Check the pickup coil resistance.

Pickup coil resistance:
400 ~ 600 Ω at 20°C (68°F)



OUT OF SPECIFICATION → Replace pickup coil.

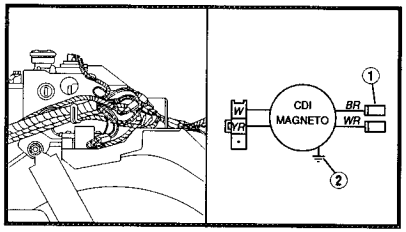
MEETS SPECIFICATION

6. Source coil resistance:
- Disconnect the source coil coupler from the wire harness.
- Connect the pocket tester (Ω x 100) to the source coil.

Pocket tester (+) lead ① → Black / Red
Pocket tester (-) lead ② → Ground

- Check the source coil resistance.

Source coil resistance:
640 ~ 960 Ω at 20°C (68°F)



OUT OF SPECIFICATION → Replace source coil defect.

MEETS SPECIFICATION

7. Connections:
- Check all connections in the ignition system.
  Refer to "WIRING DIAGRAM".

POOR CONNECTIONS → Repair.

GOOD CONNECTIONS

Replace CDI unit.

TROUBLESHOOTING

STARTER MOTOR DOES NOT WORK

NOTE:
- Remove the following parts before proceeding with the troubleshooting:
  1) Mole
  2) Footrest boards
  3) Front panel
  4) Handlebar cover
- For accurate troubleshooting use the following special tools:

Pocket tester:
90890-03112

1. Fuse:
Refer to "SWITCH INSPECTION".

NO CONTINUITY → Replace fuse.

CONTINUITY

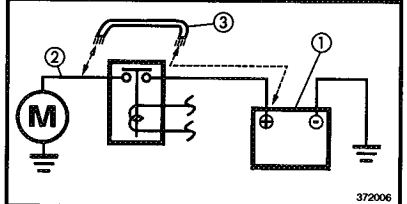
2. Battery:
- Check the condition of the battery. Refer to "BATTERY INSPECTION" in CHAPTER 3.

Open circuit voltage:
12.8 V or more at à 20°C (68°F)

OUT OF SPECIFICATION →
- Clean battery terminals.
- Charge or replace the battery.

CORRECT

3. Starter motor:
- Use a jumper lead ③ * to connect the (+) ① terminal of the battery to the starter motor terminal ②.



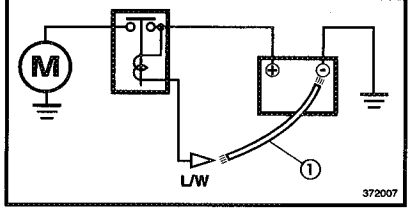
- Check the starter motor operation.

*
CAUTION:
- **If the gauge of the jumper lead is smaller than that of the battery leads, the jumper lead might melt or burn.**
- **This test could cause sparks. Never perform it near a gas source or near flammable products.**

CORRECT

DOES NOT WORK → Repair or replace the starter motor.

4. Starter relay:
- Disconnect the Blue/White lead from the wire harness.
- Connect the (-) ① terminal of the battery to the Blue/White lead.
- Check the starter motor operation.



DOES NOT WORK → Replace the starter relay.

CORRECT ⇩

5. Main switch:
Refer to "SWITCH INSPECTION".

INCORRECT → Replace the main switch.

CORRECT ⇩

6. Engine stop switch:
Refer to "SWITCH INSPECTION".

INCORRECT → Replace right handlebar switch.

CORRECT ⇩

7. Starter switch:
Refer to "SWITCH INSPECTION".

INCORRECT → Replace right handlebar switch.

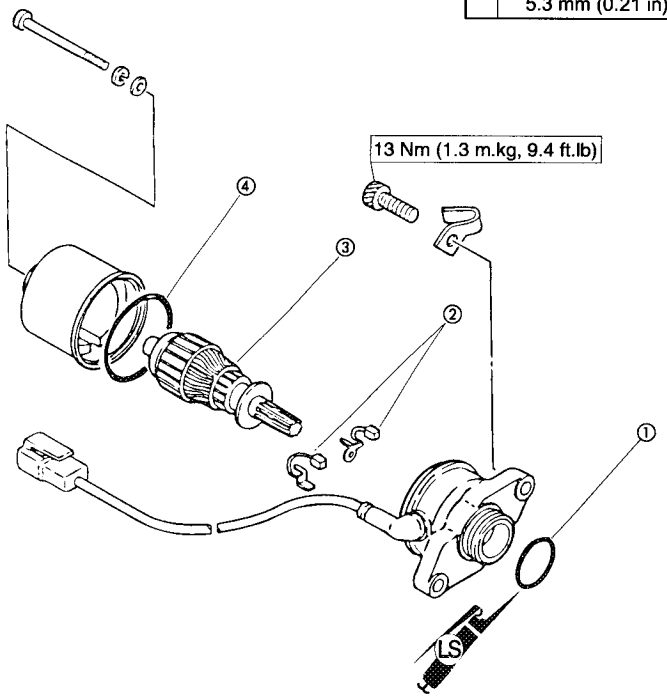
CORRECT ⇩

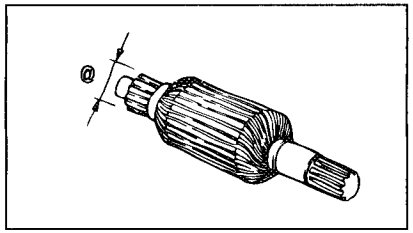
8. Connections:
Check all connections in the starter system. Refer to "CIRCUIT DIAGRAM".

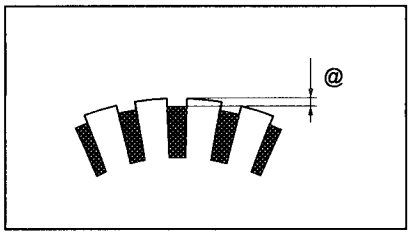
POOR CONNECTIONS → Repair.

STARTER MOTOR
① O-ring
② Brush
③ Armature coil
④ O-ring

A	COMMUTATOR UNDER CUT: 1.15 mm (0.045 in)
B	COMMUTATOR DIAMETER WEAR LIMIT: 15.0 mm (0.60 in)
C	BRUSH WEAR LIMIT: 5.3 mm (0.21 in)







REMOVAL

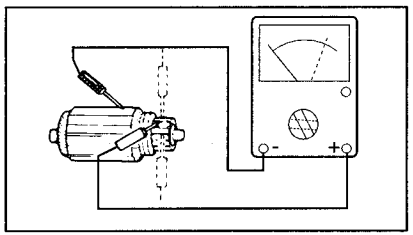
1. Inspect:
   • Commutator
   Dirty → Clean it with #600 grit sandpaper.
2. Measure:
   • Commutator diameter @
   Out of specification → Replace starter motor

Commutator wear limit:
15.0 mm (0.60 in)

3. Measure:
   • Mica under cut @
   Out of specification → To scrape the mica to proper measurement use a hacksaw blade which has been grounded to fit the commutator.

Mica undercut @:
1.15 mm (0.045 in)

NOTE:
The mica insulation of the commutator must be undercut to ensure proper operation of commutator.



4. Inspect:
   • Armature coil (resistance)
   Defect → Replace starter motor

****

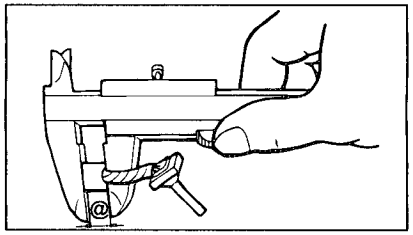
Inspecting steps:

- Connect the pocket tester to perform the continuity check.
- Measure the armature resistance.

Armature coil resistance:
0.072 Ω at 20°C

- If the resistance is incorrect, replace the starter motor.

****



5. Measure:
   • Brush length @
   Out of specification → Replace.

Brush length limit @:
5.30 mm (0.21 in)

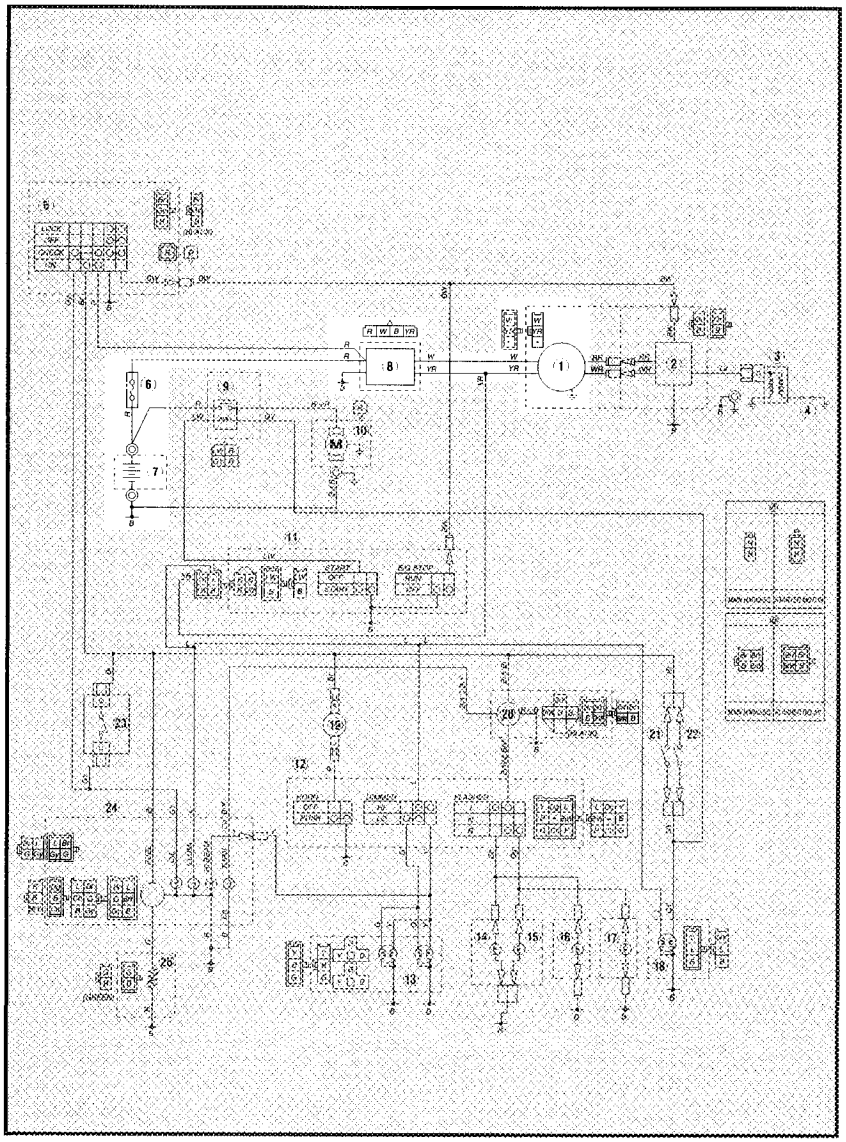
6. Measure:
   • Brush spring force
   Fatigue/out of specification → Replace as a set.

Brush spring force:
150 ~ 650 gr (5.29 ~ 22.92 oz)

7. Inspect:
   • Bearing
   Roughness → Replace.
   • O-rings
   Wear/damage → Replace.

CHARGING SYSTEM

CIRCUIT DIAGRAM



TROUBLESHOOTING

THE BATTERY IS NOT CHARGED

NOTE:
- Remove the following parts before proceeding with the troubleshooting :
  1) Mole.
- For accurate troubleshooting use the following special tools :

Inductive tachometer: 90890-03113	**Pocket tester: 90890-03112**

1. Fuse (Main)

Refer to "SWITCH INSPECTION".

NO CONTINUITY → Replace fuse.

CONTINUITY ↓

2. Battery

- Check the condition of the battery. Refer to "BATTERY INSPECTION" in CHAPTER 3.

Open circuit voltage: 12.8 V or more at 20°C (68°F)

OUT OF SPECIFICATION →
- Clean battery terminals.
- Charge or replace the battery.

CORRECT ↓

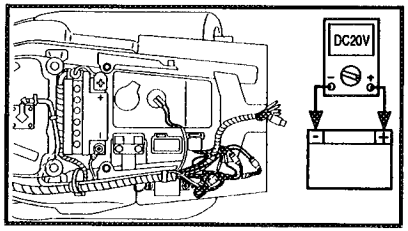
3. Charging voltage

- Connect the engine tachometer to the spark plug lead.
- Connect the pocket tester (DC20V) to the battery terminals.

Pocket tester (+) lead → Battery (+) terminal
Pocket tester (-) lead → Battery (-) terminal

- Start the engine and accelerate to about 5000 rpm.
- Check the charging voltage.

Charging voltage: 14 ~ 15 V at 5.000 tr/mn



NOTE:
Use a fully charged battery.

MEETS SPECIFICATION → Charging circuit is OK.

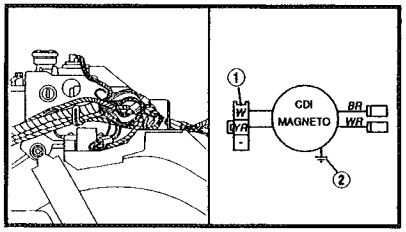
OUT OF SPECIFICATION ↓

4. Charging coil resistance

- Disconnect the CDI magneto coupler from the wire harness.
- Connect the pocket tester (Ω x 1) to the charging coil.
- Check the charging coil resistance

Tester (+) lead → White ①
Tester (–) lead → Ground ②

Charging coil resistance :
0.48 ~ 0.72 Ω at 20°C (68°F)



OUT OF SPECIFICATION

Replace charging coil.

MEETS SPECIFICATION

5. Connections

Check all connections in the charging system. Refer to "CIRCUIT DIAGRAM".

POOR CONNECTIONS

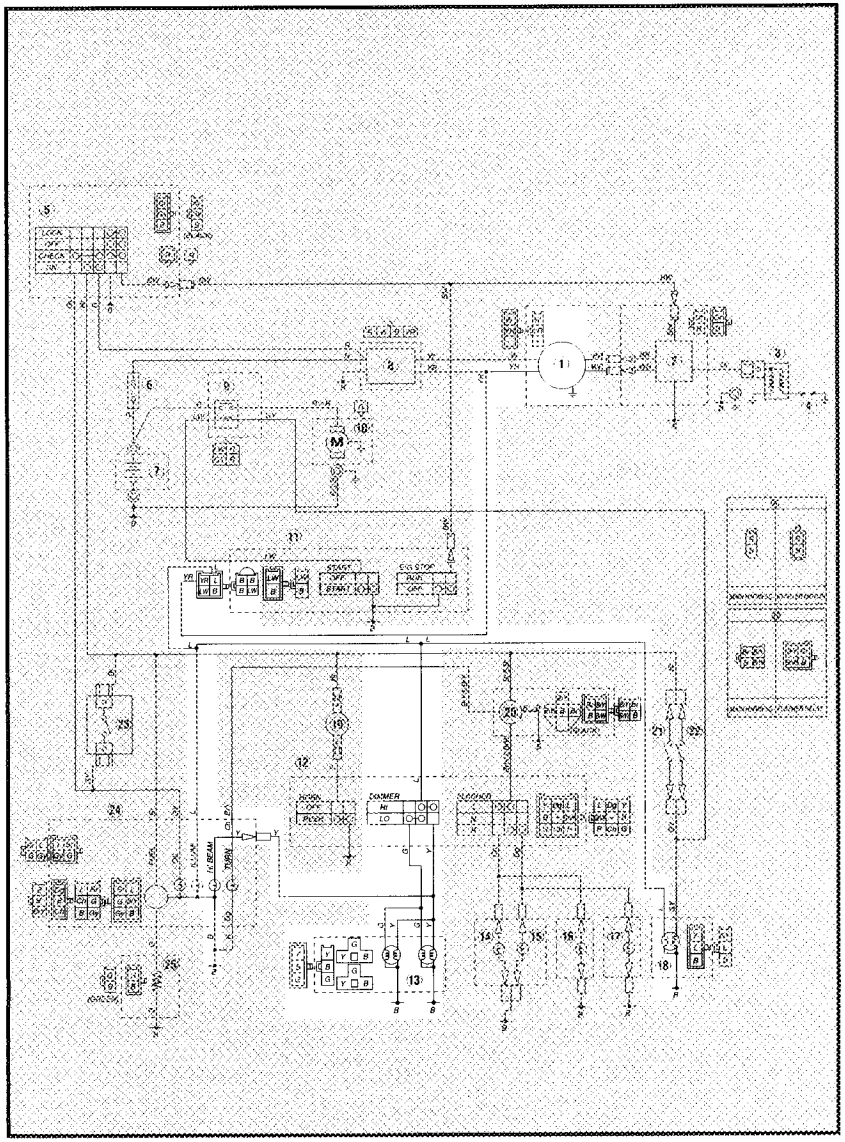
Repair.

CORRECT

Replace the rectifier/regulator.

LIGHTING SYSTEM

CIRCUIT DIAGRAM



TROUBLESHOOTING

THE HEADLIGHT, HEADLIGHT INDICATOR, TAIL LIGHT OR METER LIGHT DO NOT WORK

NOTE:

Remove the following parts before proceeding with the troubleshooting:
- Mole and footrest board
- Handlebar covers

For accurate troubleshooting use the following special tools:

Pocket tester: 90890-03112

1. "HI/LO" switch
Refer to "SWITCH INSPECTION".

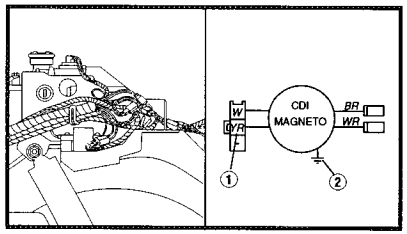
NO CONTINUITY → Replace left handlebar switch.

CONTINUITY ⇩

2. Lighting coil resistance
- Disconnect the lighting coil coupler from the wire harness.
- Connect the pocket tester (Ω x 1) to the lighting coil.
- Check the lighting coil resistance

Tester (+) lead → Yellow / Red ①
Tester (-) lead → Ground ②

Lighting coil resistance: 0.32 ~ 0.48Ω (at 20°C (68°F)



OUT OF SPECIFICATION → Replace lighting coil.

CORRECT ⇩

4. Connections
- Check all connections in the lighting system. Refer to "CIRCUIT DIAGRAM".

POOR CONNECTIONS → Repair.

CORRECT ⇩

Check condition of each circuit for lighting system.
Refer to "LIGHTING SYSTEM CHECK".

LIGHTING SYSTEM INSPECTION

1. Headlight, headlight indicator or meter light do not work.

1. Bulb and socket
- Check the bulb and socket for continuity.

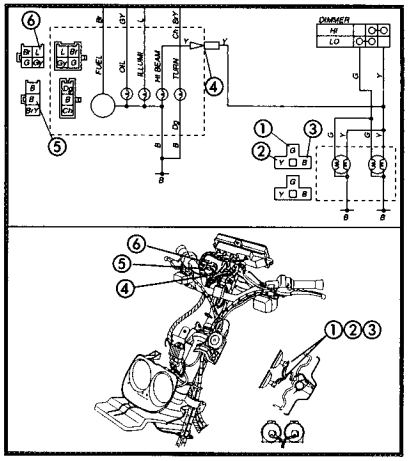
NO CONTINUITY → Replace bulb or socket.

CONTINUITY ⇩

2. Voltage
- Connect the pocket tester (AC20V) to the headlight coupler.

Headlight:
- **"LO":**
  Pocket tester (+) lead → Green ①
  Pocket tester (-) lead → Black ③
- **"HI":**
  Pocket tester (+) lead → Yellow ②
  Pocket tester (-) lead → Black ③
- **Headlight indicator :**
  Pocket tester (+) lead → Yellow ④
  Pocket tester (-) lead → Black ⑤
- **Meter:**
  Pocket tester (+) lead → Blue ⑤
  Pocket tester (-) lead → Black ⑥

- Start the engine.
- Switch from "HI" to "LO" and back.
- Check the voltage (12V) between the headlight coupler leads.



OUT OF SPECIFICATION → Wiring circuit between C.D.I magneto and socket connector is faulty → Repair.

MEETS SPECIFICATION ⇩

The circuit is good.

3. The tail light does not work.

1. Bulb and socket
- Check the bulb and socket for continuity.

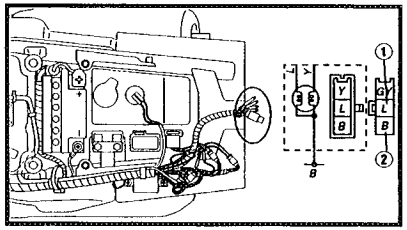
NO CONTINUITY → Replace bulb or socket.

CONTINUITY ⇩

2. Voltage
- Connect the pocket tester (AC20V) to the taillight coupler.

Pocket tester (+) lead → Blue ①
Pocket tester (-) lead → Black ②

- Set the main switch to "ON".
- Start the engine.
- Check the voltage (12V) between the headlight coupler leads "Blue" and "Black".



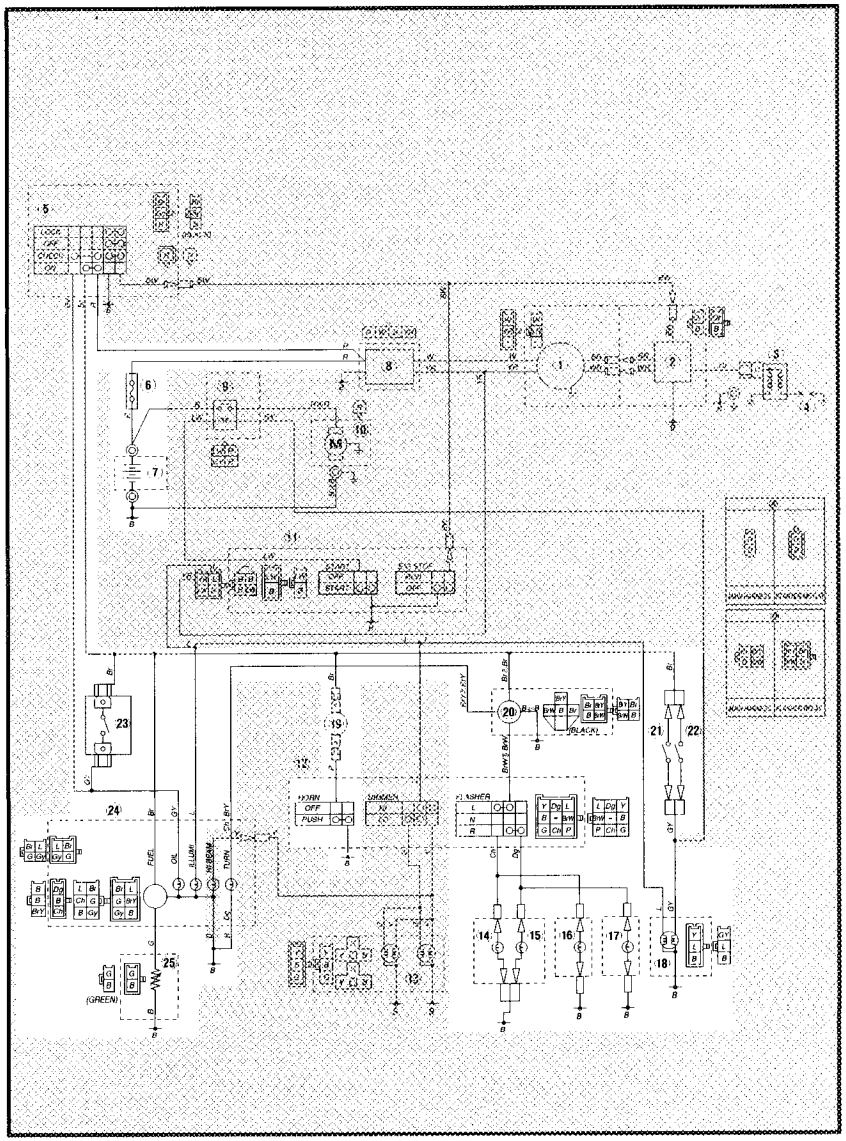
OUT OF SPECIFICATION → Wiring circuit between C.D.I magneto and taillight coupler → Repair.

MEETS SPECIFICATION ⇩

The circuit is good.

SIGNAL SYSTEM

WIRING DIAGRAM



TROUBLESHOOTING

FLASHER LIGHTS, BRAKE LIGHT, "OIL" WARNING LIGHT DO NOT WORK
HORN DOES NOT SOUND

NOTE:

Remove the following parts before proceeding with the troubleshooting:
- Mole and footrest board
- Handlebar cover

For accurate troubleshooting use the following special tools:

Pocket tester:
90890-03112

1. Fuse
Refer to "SWITCH INSPECTION".

NO CONTINUITY → Replace fuse.

CONTINUITY ⇩

2. Battery
- Check the condition of the battery. Refer to "BATTERY INSPECTION" in CHAPTER 3.

Battery voltage :
12.8 V or more at 20°C (68°F)

INCORRECT → • Clean battery terminals. • Charge or replace the battery.

CORRECT ⇩

3. Main switch
Refer to "SWITCH INSPECTION".

INCORRECT → Replace main switch.

CORRECT ⇩

4. Wiring connections
- Check all connections in the signal system. Refer to "WIRING DIAGRAM".

POOR CONNECTIONS → Repair.

CORRECT ⇩

Check the condition of each circuit of the signal system.
Refer to the section "SIGNAL SYSTEM CHECK".

SIGNAL SYSTEM CHECK

1. Horn does not sound

1. "HORN" switch
Refer to "SWITCH INSPECTION".

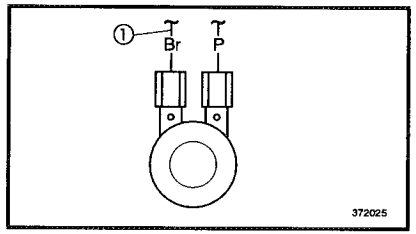
INCORRECT → Replace left handlebar switch.

CONTINUITY ⇩

2. Voltage
- Connect the pocket tester (DC20V) to the horn lead.

Pocket tester (+) lead → Brown ①
Pocket tester (-) lead → Ground

- Turn the main switch to "ON".
- Check for voltage (12V) between "Brown" and the ground.



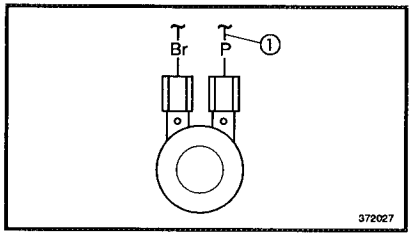
OUT OF SPECIFICATION → Wiring circuitfrom main switch to horn is faulty → Repair.

MEETS SPECIFICATION ⇩

3. Voltage
- Connect the pocket tester (DC20V) to the "Pink" lead.

Pocket tester (+) lead → Pink ①
Pocket tester (-) lead → Ground

- Turn the main switch to ON.
- Press the "HORN" switch.
- Check the voltage (12V) between "Pink" and ground.



DOES NOT MEET SPECIFICATION → Replace horn.

MEETS SPECIFICATION ⇩

Adjust or replace the horn.

2. The tail light does not work.

1. Brake switch
Refer to "SWITCH INSPECTION".

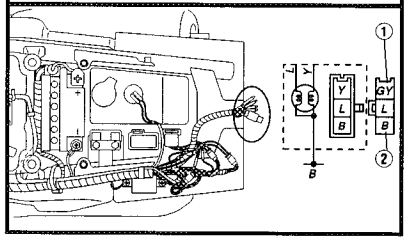
⇩ CORRECT

INCORRECT → Replace brake switch.

2. Voltage
- Connect the pocket tester (DC20V) to the socket.

Pocket tester (+) lead → Green / Yellow ①
Pocket tester (-) lead → Black ②

- Turn the main switch to "ON".
- Pull the brake lever.
- Check the voltage (12V) between " Green / Yellow" ① and "Black" ②.



⇩ MEETS SPECIFICATION

Circuit is good.

OUT OF SPECIFICATION → Wiring circuit from main switch to bulb socket connector is faulty → Repair.

3. Flasher does not work

1. "TURN" switch
Refer to "SWITCH INSPECTION".

⇩ CORRECT

INCORRECT → Replace left handlebar switch.

2. Voltage
- Connect the pocket tester (DC20V) to the flasher relay.

Pocket tester (+) lead → Brown ①
Pocket tester (-) lead → Ground ②

- Turn the main switch to ON.
- Check the voltage (12V) between the "Brown" lead and the ground.

⇩ MEETS SPECIFICATIONS

OUT OF SPECIFICATION → Wiring circuit from main switch to flasher relay connector is faulty → Replair.

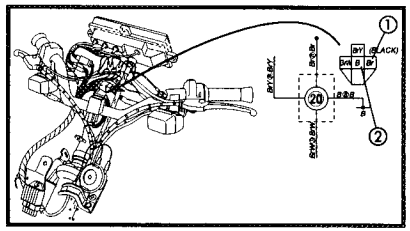
3. Voltage
- Connect the pocket tester (DC20V) to the flasher relay.

Pocket tester (+) lead → Brown/White ①
Pocket tester (-) lead → Ground ②

- Turn the main switch to ON.
- Check the voltage (12V) between the "Brown/ White" lead and the ground.

⇩ MEETS SPECIFICATIONS

OUT OF SPECIFICATION → Replace flasher relay.



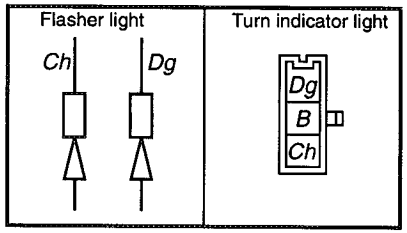
4. Voltage

- Connect the pocket tester (DC20V) to the flasher connector.

Left flasher bulb :
Pocket tester (+) lead → Chocolate ①
Pocket tester (-) lead → Ground

Right flasher bulb :
Pocket tester (+) lead → Dark green ②
Pocket tester (-) lead → Ground

- Turn the main switch to "ON".
- Set the "TURN" switch to "L", then to "R".
- Check the voltage (12V) between "Chocolate" and the ground, then "Dark green" and the ground.



OUT OF SPECIFICATION → Wiring circuit from turn switch to bulb socket connector is faulty → Repair.

MEETS SPECIFICATION → This circuit is good.

4. The "OIL" indicator light does not work.

1. Bulb and socket

- Check the bulb and socket for continuity.

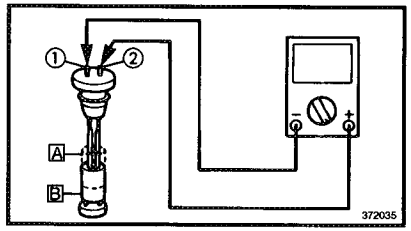
NO CONTINUITY → Replace bulb or socket.

CONTINUITY

2. Oil level switch

- Disconnect the oil level switch from the oil tank.
- Connect the pocket tester (Ω x 1) to the oil level switch.

Pocket tester (-) lead → Terminal ①
Pocket tester (+) lead → Terminal ②



- Check the switch for continuity.

Float position	Good condition	Bad condition		
HIGH	X	O	X	O
LOW	O	X	X	O

O : Continuity X : No continuity

OUT OF SPECIFICATION → Replace oil level switch.

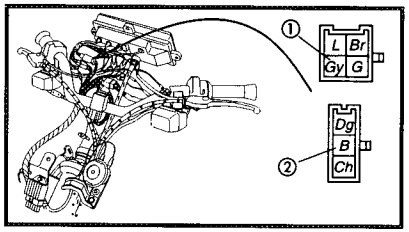
MEETS SPECIFICATION

3. Voltage

- Connect the pocket tester (DC20V) to the bulb socket connector.

Pocket tester (+) lead → Grey ①
Pocket tester (-) lead → Ground

- Turn the main switch to "*".
- Check the voltage (12V) between "Grey" and the ground.



OUT OF SPECIFICATION

MEETS SPECIFICATION → This circuit is in good condition.

4. Connections

- Check all connections in the signal system.

Refer to "WIRING DIAGRAM".

?
TRBL
SHTG
8

TRBL SHTG ?

CHAPTER 8.
TROUBLESHOOTING

STARTING FAILURE/ HARD STARTING G-8
FUEL SYSTEM G-8
ELECTRICAL SYSTEM G-8
COMPRESSION SYSTEM G-8

POOR IDLE SPEED PERFORMANCE G-8
POOR IDLE SPEED PERFORMANCE G-8

POOR MEDIUM AND HIGH SPEED PERFORMANCE G-9
FUEL SYSTEM G-9
ELECTRICAL SYSTEM G-9
COMPRESSION SYSTEM G-9

FAULTY AUTOMATIC (V-BELT TYPE) G-9
SCOOTER DOES NOT MOVE WHILE ENGINE IS OPERATING G-9
CLUTCH -OUT FAILURE G-9
POOR STANDING START (LOW CLIMBING ABILITY) G-9
POOR ACCELERATION (POOR HIGH SPEED) G-9

IMPROPER KICKING G-10
SLIPPING G-10
HARD KICKING G-10
KICK CRANK NOT RETURNING G-10

FAULTY BRAKE G-4
POOR BRAKING EFFECT G-4
MALFUNCTION G-4

FRONT FORK OIL LEAKAGE AND FRONT FORK MALFUNCTION G-10
OIL LEAKAGE G-10
MALFUNCTION G-10

INSTABLE HANDLING G-10
INSTABLE HANDLING G-10

FAULTY SIGNAL AND LIGHTING SYSTEM G-10

OVERHEATING G-11
OVERHEATING G-11

WIRING DIAGRAM G-12

TROUBLESHOOTING

NOTE:

The following troubleshooting does not cover all the possible causes of trouble. It should be helpful, however, as a guide to troubleshooting. Refer to the relative procedure in this manual for inspection, adjustment and replacement of parts.

STARTING FAILURE/HARD STARTING

FUEL SYSTEM

Fuel tank
- Empty
- Clogged fuel filter
- Deteriorated fuel or fuel containing water or foreign material
- Clogged fuel tank cap

Fuel cock
- Clogged fuel hose

Air cleaner
- Clogged air filter

Carburetor
- Deteriorated fuel, fuel containing water or foreign material
- Clogged pilot jet
- Clogged pilot air passage
- Sucked-in air
- Deformed float
- Groove-worm needle valve
- Improperly sealed valve seat
- Improperly adjusted fuel level
- Improperly set pilot jet
- Clogged starter jet
- Starter plunger malfunction
- Improperly adjusted pilot air screw

ELECTRICAL SYSTEM

Spark plug
- Improper plug gap
- Worm electrodes
- Wire between terminals broken
- Improper heat range
- Faulty spark plug cap

Ignition coil
- Broken or shorted primary/secondary
- Faulty spark plug lead
- Broken body

CDI unit system
- Faulty CDI unit
- Faulty source coil
- Faulty pick-up coil

Switches and wiring
- Faulty main switch
- Broken or shorted wiring
- Faulty " ENGINE STOP " switch

COMPRESSION SYSTEM

Cylinder and cylinder head
- Loose spark plug
- Loose cylinder head or cylinder
- Broken cylinder head gasket
- Broken cylinder gasket
- Worn, damaged or seized cylinder

Piston and piston rings
- Improperly installed piston ring
- Worn, fatigued or broken piston ring
- Seized piston ring
- Seized or damaged piston

Crankcase and crankshaft
- Improperly seated crankcase
- Improperly sealed crankcase (damaged oil seal)
- Seized crankshaft

Reed valve
- Deformed reed valve stopper
- Improperly seated reed valve
- Loose intake manifold
- Broken gasket
- Broken reed valve

POOR IDLE SPEED PERFORMANCE

POOR IDLE SPEED PERFORMANCE

Carburetor
- Improperly returned starter plunger
- Clogged or loose pilot jet
- Clogged pilot air jet
- Improperly adjusted idle speed (throttle stop screw)
- Improper throttle cable play
- Flooded carburetor

POOR MEDIUM AND HIGH SPEED PERFORMANCE

FUEL SYSTEM

Fuel tank
- Clogged fuel filter
- Deteriorated fuel or fuel containing water or foreign material
- Clogged fuel tank cap

Fuel cock
- Clogged fuel hose

Air cleaner
- Clogged air cleaner

Carburetor
- Deteriorated fuel, fuel containing water or foreign material
- Sucked-in air
- Deformed float
- Groove-worm needle valve
- Improperly sealed valve seat
- Improperly set clip position of jet needle
- Improperly adjusted fuel level
- Clogged or loose main jet
- Clogged or loose main nozzle

ELECTRICAL SYSTEM

Spark plug
- Improper plug gap
- Worm electrodes
- Wire between terminals broken
- Improper heat range
- Faulty spark plug cap

CDI unit system
- Faulty CDI unit
- Faulty source coil
- Faulty pick-up coil

COMPRESSION SYSTEM

Cylinder and cylinder head
- Loose spark plug
- Loose cylinder head or cylinder
- Broken cylinder head gasket
- Broken cylinder gasket
- Worn, damaged or seized cylinder

Piston and piston rings
- Improperly installed piston ring
- Worn, fatigued or broken piston ring
- Seized piston ring
- Seized or damaged piston

Crankcase and crankshaft
- Improperly seated crankcase
- Improperly sealed crankcase (damaged oil seal)
- Seized crankshaft

Reed valve
- Deformed reed valve stopper
- Improperly seated reed valve
- Loose intake manifold
- Broken gasket
- Broken reed valve

FAULTY AUTOMATIC (V-BELT TYPE)

SCOOTER DOES NOT MOVE WHILE ENGINE IS OPERATING.

V-belt
- Worn, damaged or slipped v-belt

Primary sheave
- Worn or damaged cam plate
- Worn or damaged slider bushing

Secondary sheave
- Broken compression spring
- Pealed lining from clutch shoe
- Worn spline of clutch housing

CLUTCH-OUT FAILURE

Primary sheave
- Seized primary sliding sheave and collar

Secondary sheave
- Broken or fatigued clutch shoe spring

POOR STANDING START (LOW CLIMBING ABILITY)

V-belt
- Worn, damaged or slipped v-belt

Primary sheave
- Worn or improper operation of weight

Secondary sheave
- Fatigued compression spring
- Improper operation of secondary sliding sheave

POOR ACCELERATION (POOR HIGH SPEED)

V-belt
- Worn or greasy V-belt

Secondary sheave
- Worn or greasy clutch shoe
- Improper operation of secondary sliding sheave

IMPROPER KICKING

SLIPPING

Kick axle assembly
- Low tension of kick clip
- Worn kick axle
- Worn or damaged kick gear
- Damaged kick clip
- Kick clip coming off
- Damaged kick clip stopper

Transmission oil
- Improper quality (low viscosity)
- Deterioration

HARD KICKING

Kick axle assembly
- High tension of kick clip
- Seized kick gear

Cylinder, piston and piston ring
- Damaged or seized cylinder
- Damaged or seized piston
- Damaged or seized piston ring

Crankcase and crankshaft
- Improperly seated crankcase
- Improperly seated crankshaft
- Damaged or seized crankshaft
- Damaged or seized crankshaft bearing

KICK CRANK NOT RETURNING

Kick axle assembly
- Damaged kick return spring
- Kick return spring coming off
- Kick clip coming off
- Damaged kick return spring stopper

FAULTY BRAKE

POOR BRAKING EFFECT

Disc brake
- Worn nbrake pads
- Worn disc
- Air in brake fluid
- Leaking brake fluid
- Faulty cylinder cup kit
- Faulty caliper seal kit
- Loose union bolt
- Broken brake hose
- Oily or greasy disc/brake pads
- Improper brake fluid level

Drum brake
- Worn brake shoe
- Worn or rusty brake drum
- Improperly adjusted brake free play
- Improper brake cam lever position
- Improper brake shoe position
- Fatigued / Damaged return spring
- Oily or greasy brake shoe
- Oily or greasy brake drum
- Broken brake cable

FRONT FORK OIL LEAKAGE AND FRONT FORK MALFUNCTION

OIL LEAKAGE
- Bent, damaged or rusty inner tube
- Damaged or cracked outer tube
- Damaged oil seal lip
- Improper installed oil seal
- Improper oil level (too much)
- Loose damper rod holding bolt
- Broken cap bolt O-ring

MALFUNCTION
- Bent, deformed or damaged inner tube
- Bent or deformed outer tube
- Damaged fork spring
- Worn or damaged slide metal
- Bent or damaged damper rod
- Improper oil viscosity
- Improper oil level

INSTABLE HANDLING

INSTABLE HANDLING

Handlebar
- Improperly installed or bent

Wheels
- Damaged bearing
- Bent or loose wheel axle
- Excessive wheel run-out

Steering
- Improperly installed steering column (Improperly tightened ring nut)
- Bent steering column
- Damaged ball bearing or bearing race

Frame
- Twisted
- Damaged head pipe
- Improperly installed bearing race

Front forks
- Broken spring
- Bended front forks

Engine bracket
- Bent or damaged

Tires
- Uneven tire pressures on both sides
- Incorrect tire pressure
- Unevenly worn tires

Rear shock absorber
- Fatigued spring
- Oil leakage

FAULTY SIGNAL AND LIGHTING SYSTEM

Headlight dark
- Improper bulb
- Too many electric accessories
- Hard charging (broken charging coil)
- Incorrect connection
- Improperly grounded
- Poor contacts (main or light switch)
- Bulb life expires

Flasher does not light
- Improperly grounded
- Discharged battery
- Faulty flasher switch
- Faulty flasher relay
- Broken wireharness
- Loosely connected coupler
- Bulb burnt out
- Faulty fuse

Bulb burnt out
- Improper bulb
- Improperly grounded
- Faulty main and/or light switch
- Bulb life expires
- Bulb burnt out

Flasher keeps on
- Faulty flasher relay
- Insufficient battery capacity (nearly discharged)

Flasher winks slower
- Faulty flasher relay
- Insufficient battery capacity (nearly discharged)
- Improper bulb
- Faulty main and/or flasher switch

Flasher winks quicker
- Improper bulb
- Faulty flasher relay

Horn is inoperative
- Faulty battery
- Faulty fuse
- Faulty main and/or horn switch
- Improperly adjusted horn
- Faulty horn
- Broken wireharness

OVERHEATING

OVERHEATING

Ignition system
- Improper spark plug gap
- Improper spark plug heat range
- Improper ignition timing

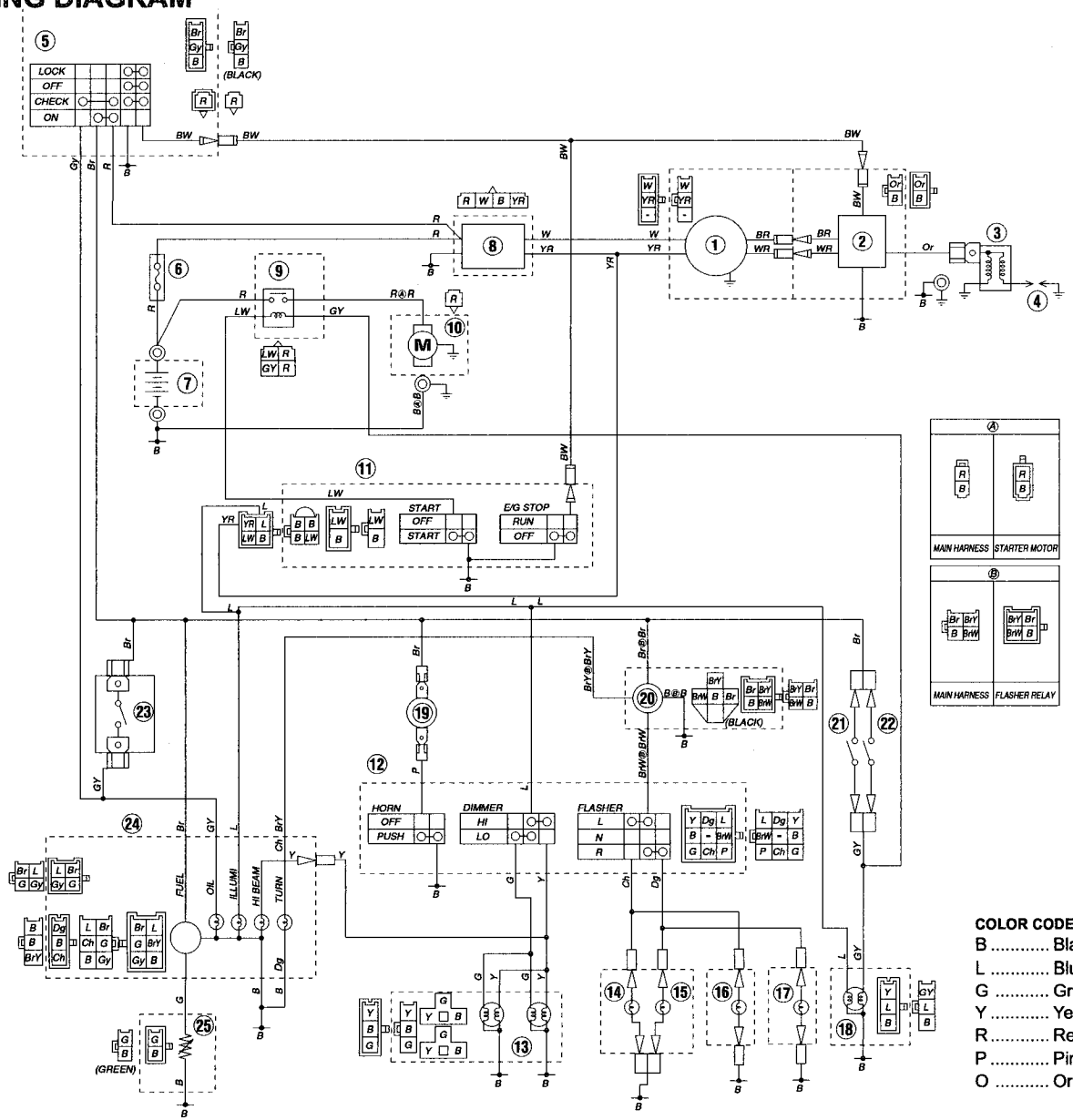
Faulty system
- Improper carburetor main jet (Improper setting)
- Clogged air cleaner element
- Lean mixture (faulty autolube pump setting)

Brake
- Dragging brake

Compression system
- Heavy carbon buildup

Cooling fan
- Damaged cooling fan
- Damaged air shrouds

WIRING DIAGRAM



① C.D.I Magneto
② C.D.I Unit
③ Ignition coil
④ Spark plug
⑤ Main switch
⑥ Fuse
⑦ Battery
⑧ Rectifier/regulator
⑨ Starter relay
⑩ Starter motor
⑪ Right handle switch
⑫ Left handle switch
⑬ Head light
⑭ Left front flasher light
⑮ Right front flasher light
⑯ Left rear flasher light
⑰ Right rear flasher light
⑱ Tail/Stop light
⑲ Horn
⑳ Flasher relay
㉑ Front stop switch
㉒ Rear stop switch
㉓ Oil level gauge
㉔ Meter
㉕ Sender

COLOR CODE

B ..... Black	Br ..... Brown	G/Y ..... Green/Yellow
L ..... Blue	Gy ..... Grey	Y/B ..... Yellow/Black
G ..... Green	Ch ..... Chocolate	Y/R ..... Yellow/Red
Y ..... Yellow	Dg ..... Dark green	Br/Y ..... Brown/Yellow
R ..... Red	B/R ..... Black/Red	Br/W ..... Brown/White
P ..... Pink	B/W ..... Black/White	W/R ..... White/Red
O ..... Orange	L/W ..... Blue/White	

Yamaha Motor Canada Ltd.
480 Gordon Baker Road
Toronto, ON M2H 3B4